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ARIZONA TEWA I: PHONEMES

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0. This is the first in a series of papers presenting structural statements about a dialect of the Tewa language. The dialect in question is that which is spoken by some of the inhabitants and erstwhile inhabitants of Tewa (known also as Hano) and Polacca, communities located at First Mesa on the Hopi Indian Reservation in Northern Arizona.[1]

The inventory of symbols which are used in the discussion to follow of Tewa phonology is listed next below; various sections are indicated in which the values of the various symbols are given.

Junctures: /, + (**1**).

Tones (or registers): ´,ˋ (high and low tone, respectively); the mark ˋ is used only in discussions of tone; in the writing of texts, low tone is marked by the absence of ´ (**7**).

Subregisters: ˆ, ˇ (**7**).

Components: P, T, K, S, Na, Or, Gl, Vl, Vd, I, E, U, O, A (**2**).

Segments: p, t, k, ṕ, ṫ, ḱ, b, d, g, m, n, s, l, ʔ, h, w, y (**4**); i, e, u, o, a, į, ę, ų, ǫ, ą (**5**).

Segment classes: *Z*, V_{md}, V_{ml} (**3**).

1. Open transition (completion of the release of a given phone before the onset of a

[1] Ancestors of the present-day Arizona Tewa came to live among the Hopi during the 17th century. Other dialects of Tewa (a member of the Tanoan family) and other Tanoan languages are spoken in New Mexico. It is said that all Arizona Tewa are bilingual in Hopi and in Tewa but that no Hopi ever learns to speak Tewa. See Edward P. Dozier, the Hopi-Tewa of Arizona, UCP-AAE 44 (1954). For treatments of another dialect of Tewa see Harry Hoijer and Edward P. Dozier, The Phonemes of Tewa, Santa Clara Dialect, IJAL 15.139–144 (1949); Dozier, Tewa II: Verb Structure, IJAL 19.118–127 (1953).

The materials forming the basis of the present analysis were gathered by me in the course of approximately six months of work with informants in the summers of 1955, 1956, 1957, 1958. Two native speakers of Arizona Tewa served as informants. Both of these individuals (one a man, the other a woman) are in their early thirties. Both also speak Hopi, and both speak English with ease, but neither of them shows full native command of the language. Work with Tewa informants in 1955 and 1956 was done in the course of field trips made to Arizona while I was a student in the Graduate School of Indiana University. These field trips were made possible through grants received from Indiana University, and to this institution I wish to express my gratitude. Magnetic recording tape and recorders were supplied by the Archives of Languages of the World, Indiana University. Much of my work with informants has been done during periods of residence at the Research Center of the Museum of Northern Arizona—first as a student benefiting under the joint field-station program of Indiana University and the Museum of Northern Arizona and later as an independent researcher. To the members of the staff of the Museum I wish to express my thanks for the many kindnesses which they have shown me throughout my stays. The treatment of Tewa structure to be presented hereinafter is a revised and extended version of my doctoral dissertation, Phonology and Morphology of Hopi-Tewa, Indiana University (1957). I have benefited most highly from continued discussions with C. F. Voegelin, under whose direction the dissertation was written.

following phone) with no pause or very brief pause is marked +.

Initiation of speech activity, termination of speech activity, and open transition with pause longer than that associated with + are marked #.

Close transition is left unmarked.

Sequences of phonemic segments accompanied by tonal and stress features and encompassed by successive instances of # are referred to as (macro)spans.

Statements are made under (**4**) and (**5**) concerning the classes of segments and segment sequences which can precede and follow #. The same kind of information is given for + under **6**.

2. In this section we list a set of articulatorily-derived components which in various combinations compose entities written herein with unit letters. Such entities are termed SEGMENTS (**4.1**).

2.1. Lingual-labial articulation is a general term comprising consonantal and vocalic articulation.

2.1.1. Consonantal articulation includes four components. These are as follows: P, bilabial stop or labial friction; T, tongue-tip stop; K, tongue-back stop; S, tongue-blade constriction ranging from sibilant to shibilant to lateral.

2.1.2. Vocalic articulation includes five components. These are as follows: I, tongue in high front position, lips unrounded; E, mid front unrounded; U, high back rounded; O, mid back rounded; A, front central unrounded.

2.2. Velic articulation includes two components: Na, velic lowered; Or, velic upheld.

2.3. Glottal articulation includes three components: Gl, glottal stop; Vl, voiceless, Vd, voiced.

2.4. Cover symbols for the consonantal and vocalic components are, respectively, c and v. A cover symbol for consonants, those segments which include a consonantal component, is C; a cover symbol for vowels, those segments which include a vocalic component, is V. Superscript component symbols are appended on occasion to letters C and V; thus C^{Na} = any consonant which includes component Na as part of its constituency.

3. V_{md} = any vowel which in a given instance displays a length of one mora. On occasion—as in the formula written out at the end of the present section—the symbol is used to refer to an uninterrupted sequence of such vowels.

V_{ml} = any vowel which in a given instance does not have mora length.

Z = any segment which is not a V_{md} or any uninterrupted sequence of such segments.

Each macrospan conforms to a pattern which can be represented as follows: $\#(ZV_{md})_{1(, \ldots, n)} \pm Z\#$.

4. A set of frames is listed below under **4.1.** In these frames (or in contexts represented by these frames), there appear various combinations of components constituting Z segments and sequences of Z segments. These component combinations fall into various sets according to the frames in which they occur. These sets are listed below under **4.2.** Each set is labelled by the numbers of the frames in which its members appear.

4.1. Frames in which appear segments labelled Z and clusters of such segments are as follows:

(I) # ... V_{md}.

(II) V_{md} ... V_{md}.

(III) V_{md} ... #.

The sets of Z are listed in subsections **4.2** through **4.6**. The placement of a hyphen between symbols for components (as, P-Or-Vl) indicates the following: components whose symbols are so joined are produced simultaneously (overlapping or coextensive articulation) or in close transition.

One example for each context is given for each listed component combination.

Unless otherwise indicated (by the placement of ... fore or aft) every example is a macrospan—that is, begins and ends with #.

(A combination of *Z*-components, wholly or partially simultaneous or in close transition, is segmented in the following way: each minimum combination of components which appears in frame (II) is, with one exception, always written, in whatever combination it appears, with a unit letter—that is, not with a diacritic. The exception can be stated as follows: a minimum combination of components which appears in frame (II) is not written with a unit letter when the remainder with which it occurs does not also appear in frame (II). Thus, P-Or-Gl is written ṗ rather than p?. While ? (Gl) appears in frame II, the remainder (P-Or) does not. Entities which are written with unit letters are called SEGMENTS.)

4.2. In numbered paragraphs (1) through (26) there are listed, with exemplification, the twenty-six component combinations which appear both in frame (I) and in frame (II), but not in frame (III).

(1) P-Or-Vl = p. pé́ˇdómúń *I see the deer*; dópíyé?an *I borrowed it.*

(2) T-Or-Vl = t. túˇdókhyaw *I found the beans*; dótay *I know him.*

(3) K-Or-Vl = k. káńˇhé?náátay *you know that you know him*; ?ụkáńnáátay *remember, you know him.*

(4) T-S-Or-Vl = ts. tseedómúń *I saw the eagle*; dótseemúń *I saw the eagle.*

(5) P-Or-Gl = ṗ. ṗindóˇkhwíńméyú *I was looking at the mountain*; díípoḳwíí *I went swimming.*

(6) T-Or-Gl = ť. ťówá? andókhyaw *I found the moccasins*; ?o?eťáń *I fell.*

(7) K-Or-Gl = ḳ. ḳúwádobééˇmúń *I saw the sheep*; díípokúúwán *I was swimming.*

(8) T-S-Or-Gl = ťs. ťsééwa?inamu *he's a drunkard*; naťsééwamu *he's crazy.*

(9) P-Or-Vd = b. bimaaˇką?o *you're learning*; dibihwíí?o *are you eating?*

(10) T-Or-Vd = d. díihwíí?o *I'm eating*; didenhwíí?o *are you two eating?*

(11) K-Or-Vd = g. gimaaḳan *we all know how*; ḳeegedópaa *I built a house.*

(12) P-Or-Vl-V^{vl} = ph. (For V^{vl} see (24) below.) phụyụdókhwíńméyú *I was looking at the fly*; dóphụyụkhwíńméyú *I was looking at the fly.*

(13) T-Or-Vl-V^{vl} = th. thanpóóbídókhwíńméyú *I was looking at the sunflowers*; dóˇtháá *I broke it.*

(14) K-Or-Vl-V^{vl} = kh. khoodókhyaw *I found the leggings*; dókhookhyaw *I found the leggings.*

(15) and (16) K-Or-Vl-V^{vd}_{ml} = kw and ky. (For V^{vd}_{ml} see (28) and (29) below.) kwiyódómúń *I saw the woman*; dókwiyómúń *I saw the woman.* kyú?íń?o?ę́ę́ko *I dreamed about the dead people*; nabíḳeegenakyawe *my house is leaky.*

(17) and (18) K-Or-Gl-V^{vd}_{ml} = ḳw and ḳy. ḳwéńdókhyaw *I found the jackrabbit*; dóḳwéńkhyaw *I found the jackrabbit*; ḳya *spill*; dóḳya *I spilled it.*

(19) and (20) K-Or-Vl-V^{vl}-V^{vd}_{ml} = khw and khy. khwimu?idósuulu *I untied the knot*; nakhwaabe?ę?ę *he's coming down*; khyawpí?í *don't get up!* dókhyaw *I found it.*

(21) and (22) V^{vl}-V^{vd}_{ml} = hw and hy. hwíńdómúń *I saw the mouse*; ?ihwíí?o *he's eating*; hyą?dókhyaw *I found the nest*; dóhyą?khyaw *I found the nest.*

(23) S-Or-Vl = s. sendómúń *I saw the man*; hąsé?isen *hungry man.*

(24) (v-(Na ~ Or)-Vl)$_{ml}$ = h. h is, in effect, a mora-less, voiceless anticipation of a following V^{vd}, a voiceless prolongation of a preceding V^{vd}, a voiceless transition between two V^{vd}. h is labelled V^{vl}. We have not made a tabulation to ascertain whether all possible combinations of v, (Na ~ Or), and Vl occur. hodíihwíí?an *I ate already*; dihobihwíí?an *have you already eaten?*

(25) P-Na-Vd = m. máńwóówá?an *he cured him*; ?obímaaką?o *you all are learning.*

(26) T-Na-Vd = n. nan?íbíhwíí?o *we're eating*; ?undiˇnandítay *you know us.*

4.3. Component combinations (27) through (29) appear in frames (I), (II), and (III).

(27) Gl = ʔ. ʔimaaka̋n *you all know how*; dííhwíí?o *I'm eating*; dóką? *I brought it.*

(28) and (29) (U-(Or ~ Na)-Vd)$_{ml}$ = w; (I-(Or ~ Na)-Vd)$_{ml}$ = y. These segments are labelled V^{vd}_{ml}. Oral variants occur in the neighborhood of oral V_{md}; nasal variants occur in the neighborhood of nasal V_{md}. wobéńtay *someone knows you two*; naaˇdiwítay *I know you*; wí?thaw *one day*; yóónasaa *the cacti are standing up*; nayóósaa *the cacti are standing up*; ʔųˇdidítay *you know me.*

4.4. Component combinations (30) and (31) appear in frames (II) and (III).

(30) and (31) V^{vd}_{ml}-Gl = wʔ and yʔ. nabíkawʔ *my song*; wí?thaw?ome *one day I went*; ibíkayʔ *his prayer.* dóńtay?an *I showed it to someone.*

4.5. Component combination (32) appears in frame (III).

(32) K-Na-Vd = ŋ. ŋ is written n (see (41) below). In certain contexts, C^{na} combine with tone. In the frame: V_{md} ... ⸗, ń is in contrast with ǹ. Compare nabíťúń *my basket*, ʔikúúwán *he's trying to lie down.*

4.6. Component combinations (33) through (52) appear in frame (II).

(33) S-Or-Vd = l. ʔi?ęęlų *he ran.*

Also occurring in frame (II) are various combinations of the type Z_2-Z_1, where Z_2 = any combination of components (24) through (32) and Z_1 = any combination of components (1) through (29). In lieu of presenting a complete list of all clusters of the type Z_2-Z_1 which are found in the corpus, we present examples illustrating the Z_2 participating in clusters of this type.

m, n, and ŋ, as Z_2, are in complementary distribution with one another. In all contexts represented by the frame: V_{md} ... Z_1-V_{md}, we write only one symbol for C^{na}, namely, n. In contexts in which the preceding V_{md} bears high tone, ń is in contrast with ǹ. ʔikúúwánde *he lies down*; máńtay *he knows him.*

(34) through (36) m-Z_1. m occurs before Z_1 in which the first or the only segment includes component P. máńpíyé?an *he borrowed it*; ʔunbíkwiyóo *your wives*; ʔųhe?inmabéńtay *you know them.*

(37) through (40) n-Z_1. n occurs before Z_1 in which the first or the only segment includes component T or component S. máńtay *he knows him*; he?inˇdidítay *they know me*; he?inniilen *those chickens*; he?inseenin *those men.*

(41) through (46) ŋ-Z_1. ŋ occurs before Z_1 in which the first or the only segment includes component K; before Z_1 consisting of ʔ or V^{vd}_{ml} (w or y); before Z_1 consisting of or beginning with V^{vl} (h). ʔanǩwíí *we lay down*; sóngithaw *four days*; den?an *those two did it*; máńwóówá?o *he's curing him*; né?íńyóo *these cacti*; didenhwíí?o *are you two eating?*

(47) w-Z_1. wí?thaw?ome *one day I went.*

(48) y-Z_1. dóńtay?an *I showed it to someone.*

(49) ʔ-Z_1. wí?thaw *one day.*

(50) w-Z_1. máńkaw??o *he's singing.*

(51) y-Z_1. na kay?pó *he asked for something.*

(52) h-Z_1. ʔoda+hąséhpó *I'm very hungry.*

4.7. This section presents phonetic addenda to preceding subsections.

Combinations (5) through (8) (ṗ, ť, ǩ, ťs) are phonetically glottalized stops and affricate. Glottal and oral stop closure are effected simultaneously, and the oral release is made before the glottal.

Some of the component combinations which include K ((3), (7), (11), (14)—k, ǩ, g, kh respectively) are palatalized when immediately followed by a *V* displaying components I or E. dóken *I'm getting it*; ǩííbé *trap*; ǩegeháńgénapó?á *he came up to the house*; khingi?i?i?di . . . *down the hill.*

Component combination (9) (P-Or-Vd = b) is in all positions in which it occurs phonetically v or β, labiodental or bilabial spirant; in addition, in the position immediately following C^{na} the spirantal variants are in free variation with stop variant b. dibihwíí?o *are you eating?* inbíkege *their house.*

Component combination (23) is a median

sibilant varying (probably ideolectically) with shibilant. Combination (33) is a frictionless lateral continuant.

5. Componential combinations not already mentioned which involve vocalic components are treated in this section. All *V* here treated are V_{md}—as opposed to V_{ml} (w, y, and h).

5.1. The loci of tonemic contrast (other than, in certain contexts, C^{na}) are the V_{md}. With one exception, every instance of a V_{md} is accompanied by one or the other of the two tones. The exception is as follows: in the position immediately preceding #, sequences of the type V_{md} and V_{md}-V_{md} display a continuum from full voicing to terminal devoicing to complete devoicing throughout. When the vowel or vowel cluster is completely devoiced, it has no tone. Such vowels are marked ˟. Thus, héénapót+ʔihwíkanťǒ *he's going to eat in a little while*. We have not made a tabulation for the purpose of ascertaining which of the vowels, if not all of them, occasionally appear devoiced before #. V_{md} are entered below as displaying the component of voicing.

5.2. In the frame: Z_1 ... *Y* (where $Y = Z$ or #), there appear sequences of the following sorts: (a) V_{md}; (b) V_{md}-V_{md}. Two V_{md} in succession are always identical.

Combinations of tones with sequences of the above-mentioned types are as follows: with (a), ′ or ˋ; with (b), ″, ˋˋ, ˆˋ, or ˇ. The combination ˇ occurs only with vowel sequences in which the vowels include component A.

5.3. The various V_{md} are listed and exemplified in this section. Each of the vowels is illustrated in one or both of the sequences listed above as (a) and (b) (always including (a)).

(53) I-Or-Vd = i. dítayheʔdi *he knows me*; díʔan *I did it*; díʔan *they did it*; ʔothatii *I went broke*.

(54) E-Or-Vd = e. heʔdidítay *he knows me*; dobéétay *I know them*; tsʃʔée *birds*.

(55) U-Or-Vd = u. khwimuʔidósuulu *I untied the knot*.

(56) O-Or-Vd = o. dótay *I know him*; kwiyóo *women*.

(57) A-Or-Vd = a. kuwapíʔí *don't lie down*! dóˇtháá *I broke it*.

(58) I-Na-Vd = į. tsʃʔée *birds*.

(59) E-Na-Vd = ę. ʔeeyę́ *child*; ʔéeyę́ę *children*; dótęęlę *I pulled it*.

(60) U-Na-Vd = ų. dóphųyųkhwíńméyú *I looked at the fly*; nabíkhúų́ *my legs*; hwatiwóopųųťódí *I'm not going to go yet*.

(61) O-Na-Vd = ǫ. náyǫ́ *tell him to do it*!

(62) A-Na-Vd = ą. hąsé?isen *hungry man*.

5.4. In certain contexts—namely, in the positions immediately preceding and immediately following C^{na}—each oral V_{md} and cluster of like oral V_{md} is in free variation with its nasal counterpart. In these contexts, symbols for oral V_{md} are written exclusively. nabitun *my plaque*; ʔobíńháábé *you broke it*; namu *it is*; naáńˇdómúń *I saw it*.

6. The class of segments and segment sequences which precede + is equal to Z_2, V_{md}, k, and t. The class of segments and segment sequences which follow + is equal to Z_1. nanheʔin+wíkíń+ʔáńtay *we two know them*; kegepénú+peʔediˇnamen *he's going from in front of the house* ʔoyʔwíʔkaayįʔné?bííwet+namu *the other is farther away*; didamuumík+ʔonaʔa *I wanted them to go away*.

7. In this section, pitch contours from which are extracted tonal features are described.

7.1. *Td* = tone-bearing segment, one of the loci of tonemic contrast. *Td* are the V_{md} and (in certain contexts) C^{na}.

A LEVEL is defined as a sequence which (a) is reducible to the pattern $(Z_1\text{-}V_{md}\ Z_2)_{1(,\ \cdots\ ,n)}$ and in which (b) all *Td* bear the same pitch.

(In the examples in this section, a bracketed number placed immediately following a *Td* indicates the relative pitch of that

Td within the span. The pitch of the first *Td* of the span is called 0, and other numbers refer to the number of semitones by which a given *Td* is higher or lower than the first *Td*; + stands for higher than 0; − stands for lower than 0.)

Examples of levels are given in the paragraphs below.

wí[0]yé[0]díń[0]ˇkhwę́ę́[−2]ɬú[−2]ḱó[−2] *I have two dead squirrels*: wíyédíń; khwę́ę́ɬúkó.

wí[0]yé[θ]díń[0]ʔan[−4]ḱó[−2] *I have two shoes*: wíyédíń; ʔan; ḱó.

A level is said to be in initial position if its first segment is the first segment of the span; it is said to be in final position if its last segment is the last segment of the span. All other levels are said to be in medial position.

An UPPERMOST LEVEL (UML) is defined as a level which adjoins on one side, if it is initial or final, or adjoins on both sides, if it is medial, a level than which it is higher in pitch. wí[0]yé[0]díń[0]ʔan[−4]ḱó[−2] *I have two shoes*: wíyédíń; ḱó.

A LOWERMOST LEVEL (LML) is defined as a level which adjoins one side, if it is initial or final, or adjoins on both sides, if it is medial, a level whose pitch is higher than its own. wíyédíńʔanḱó (pitches as above): ʔan.

A succession of segments which belong neither to a UML nor to a LML belongs to one or more IN-BETWEEN LEVELS (IBL).

A DOWNWARD PROGRESSION is a sequence composed of a UML plus the following IBL (if any) plus the following LML. wíʔ[0]díń[0]ˇt́úń[−2]ˇḱó[−3] *I have one plaque.*

An UPWARD PROGRESSION is a sequence composed of a LML plus the following IBL (if any) plus the following UML. ḱe[0]ge[0]háń[+2]gé[+2]na[−3]pó[−1]ʔá[−1] *he came to the side of the house*: ḱegeháńgé; napóʔá.

7.2. If a span consists (a) of a single level or (b) of a downward progression in which each of the levels is separated from contiguous levels by intervals of less than a minor 3d (three semitones) in size and in which the size of the interval between the UML and the LML is no more than four semitones, then the pitch relationships obtaining among the various *Td* do not provide sufficient information for deciding, in the case of (a), whether the pitches are to be identified as ′ or ‵; or for deciding, in the case of (b), how many of the levels are ′ and how many ‵ or whether they are all ′ or all ‵. It is necessary to make reference to the relative placement of the span as a whole within the speaker's normal voice range. If such sequences are placed relatively high, their pitches are identified as ′; if such sequences are placed relatively low, their pitches are identified as ‵. ḱíbé (level) *trap*; nakhę́win (level) *it's sticking up out of the ground*; di[0]ˇmaa[−2]ˇḱan[−3] *they all know how*; wí[0]yé[0]ˇdín[−1]-ˇt́ún[−2]ḱó[−2] *I have two plaques.*

When a span-length downward progression contains a gap between any of its levels of three semitones or more, or when the downward progression as a whole covers a pitch range of more than four semitones, then its UML is identified as ′. In the examples given next, the transition between ′ and ‵ is between the two levels separated by an interval of three semitones or more. díń[0]khó[0] to [−3]ḱo[−3] *I have a bracelet*; díń[0]ˇyáń[−1]ḱa[−5]na[−5] *I have an orchard*; yáń[0]ʔéé[0]na[−5]khę́[−5]ˇsaa[−7] *some little trees have been transplanted.*

The last UML of a multi-UML span is always ′. hwíí[0]kan[−3]ʔi[−3]díń[−2]ḱŏ *I have a table*: díń.

Every non-final UML which is higher in pitch than the next following UML is ′. In the example above: hwíí.

Every non-final UML which is lower in pitch than the next following UML is ‵. nan[0]ˆho[+1]ʔan[0]hwíí[+3]ʔan[−5] *we've already eaten*: ho.

In a span in which an initial UML is as high as but not higher in pitch than the following UML, the initial UML is (a)

′ or (b) ˋ according as the following conditions are met:

(a) ′, if the downward progression which starts from the UML in question contains at least one step downward as large as a minor 3d. yóh[0]ku[−3]wa[−3]kéé[0]ʔo[−3]ʔen[−3] *I was sitting on the bed*: yóh.

(b) ˋ, if the downward progression which starts from the UML in question contains no step downward as large as a minor 3d. he[0]ˇʔin[−2]ˇdo[−1]béń[0]tay[−7] *I know those two*: he.

Every non-initial UML whose pitch is as high as but no higher than the next following UML is ′. hęę[0]lę[0]ʔáy[+2]ʔo[0]bíń[+2]paa[−5] . . . *you made something good*: ʔáy.

All LML, except some of those which are final within the span, are ˋ. he[0]ˇʔin[−2]ˇdo[−1]béń[0]tay[−7] *I know those two*: do; tay.

All IBL in a downward progression starting from a UML which is identified as ˋareˋ. In the example above ʔin.

In an upward progression ending in a UML identified as ′, all IBL are ˋ. naa[0]ˆdi[+2]wí[+3]tay[−2] *I know you*: di.

In a four- or five-level non-final downward progression starting from a UML identified as ′, and in a four- or five-level final but not initial downward progression starting from a UML identified as ′, the transition between ′ and ˋ is between the third and fourth levels or at the first step-downward of three semitones or more, whichever is first. háá[0]ˇdá[−1]na[−3]bí[−1]ˇpáá[−2]ˇda[−3]bi[−5]ˇʔęę[−7]ˆlų[−5] . . . *why did you run into the front of my car*? compare wíʔ[0]ˇyáń[−1]ʔee[−5]ˇna[−6]khę[−6]kyáń[−5] *one little tree has been transplanted*; di[0]ʔáy[−1]ˇya[0]ˇan[−2]na[−4]ˇmu[−7] *is it a good one*?

In a three-level non-final downward progression starting from a UML identified as ′, only the LML is ˋ, unless an interval of three semitones or more intervenes between the UML and the second level. há[0]gú[0]ˇhó[−2]dó[−2]kwa[−4]hó[−2]mí[−2] *maybe I'll take it out*; compare wí[0]yé[0]yáń[0]ʔee[−4]ˇna[−5]khę[−5]kyáń[−4] *two little trees have been transplanted*.

In a three-level final but not initial downward progression starting from a UML identified as ′, all levels are ′ unless an interval of three semitones or more intervenes between the second and the third or between the first and the second levels. The transition between ′ and ˋ is at the first step-downward of three semitones or more. po[0]ye[0]díń[+2]ˇťúń[+1]ˇƙwóń[0] *I have three baskets*; po[0]ye[0]díń[+2]ˇtsį[0]ʔee[−3]ƙwon[−3] *I have three birds*; po[0]ye[0]yáń[+1]ʔéé[+1]díń[+1]khę[−3]ˇsaa[−6] *I have three transplanted little trees*.

In a two-level final but not initial downward progression starting from a UML identified as ′, both levels are ′ unless an interval of three semitones or more intervenes between the two levels. na[0]díń[+2]ˇƙú[0]wá[0]ʔéń[0] *I have a sheep*; po[0]ye[0]díń[+2]kee[−5]ƙwon[−5] *I have three bears*.

7.3. Any *Td* bearing ′ is said to fall within the HIGH REGISTER; any *Td* bearing ˋ is said to fall within the LOW REGISTER. A drop in pitch from one level to the next lowest level within the high register or within the low register is identified as an instance of ˇ. A rise in pitch from one level to the next highest level within the low register is identified as an instance of ˆ. na[0]díń[+2]ˇƙú[0]wá[0]ʔéń[0] *I have a sheep*; yáń[0]ʔéé[0]di[−5]khę[−5]ˇsaa[−7] *some little trees have been transplanted around*; naa[0]ˆdi[+2]wí[+3]tay[−2] *I know you*. (Symbols ˆ and ˇ are placed before the symbols for Z_1 and refer to the pitch level of all following *Td* up until a further change in level.)

A COMPARISON OF FIVE SALISH LANGUAGES: II

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3.0. Introduction
3.1. Independent personal pronouns
3.2. Possessive pronouns
3.3. Completive-customary subject pronouns
3.4. Completive-customary subject-object pronouns

3.0. The comparison of Salish pronouns permits an understanding of the development of the languages perhaps better than any other phase of the morphology.

The following series of pronouns are significant: independent personal, possessive, and subject pronouns of the completive-customary systems; object-subject pronouns of the completive-customary; and subject-object pronouns of the continuative system.[1] Each series will be presented comparatively below.

3.1. The independent personal pronouns are:[2]

	Till	Cheh	S-D
1	ʊnʒá	é-n-ca	á-cə, é-cə
2	ʊngi	náw-e	dégwi
3	ʒəní·ł	cá-n-e	cə-d-ił
P1	niwá·ł	i-n-é·m	dí-buł
P2	gəlgóla	i-lá·-pa	gu-lá-po
P3	ʒʊnʒʊnc, łiłaʒi	cə-n-e-á·wmš	cá-d-ił

	CA	Kal
1	čɪ-n-ǣ?ǣ	quy-e?é
2	kú-w'-æ	a-n-uí
3	cǣ-n-il	cə-n-ílc
P1	č-lí-pus-t	qe?-n-pəl-é
P2	ku-p-lí-pus-t	n-pəl-é
P3	cə-n-íl-ılš	cən-í?lc

Comparison shows -n- to be a common element of the series with the following explanation of contractions:

CA kuw'æ < ku-n-wæ, or possibly ku-n-'æ (not previously determined, cp. CA §§281, 284 for analogies).

n-l > l: Possibly Cheh ilá·pa < i-n-lá·pa

CA P1 člípust < č-n-lípust (not previously determined for CA). Probably also P2 kup-lípust < kup-n-lípust, although the position of n is doubtful and there may be other reasons for its disappearance here.

The relationship of the S-D pronouns may be understood in part from the changes CA n > S-D d; CA m > S-D b. S-D 1 ácə, écə > Cheh énca. S-D 2 dégwi > Cheh náw-e (d > n, gw > w, i > e). S-D 3 cə-d-ił > Cheh cá-n-e (d > n, -ił is unaccounted for). S-D P1 díb-uł > Cheh i-n-é·m (d > n, b > m, uł- not accounted for).

Voicing of c, č to Till ʒ is obvious in 1, 3, P3.

Unexplained is the presence or absence of vowels, or if present, their quantity and accent. Cheh, S-D P2 a of ilá·pa and gulápo is i of CA kuplípust, lacking in Kal npəlé, but the problem is more complicated than the simple formula a > i indicates.

Apparently S-D 3 -ił, CA3-il, and Kal3-ílc have a relationship different from the third person plurals: Cheh -awmš, CA -ılš, and Kal -i?lc· the glottal stop of the last is doubtless explained by its regular pluralizing function (cp. Kal §19).

[1] In the following discussion two systems are differentiated, which because of Coeur d'Alene, are called 'completive-customary' and 'continuative.' There is evidence that Chehalis has a form comparable with the Coeur d'Alene customary, that Snoqualmie has a customary prefix or independent particle, but no suffix modification with the stem. Chehalis sometimes requires the finite forms for subordination, sometimes the continuative or nominal form. Kalispel parallels Coeur d'Alene closely in the differentiation. The Chehalis and Tillamook conditions will be discussed under 'Aspect'.

[2] Numbers refer to persons; if they occur without a letter, as 1, they indicate singular; if with the letter P, plural. Numbers occurring together, as 1-2, mean subject-object in English order, for example, 1-2 means I . . . you.

3.2. The following are the possessive pronouns:

	Till	Cheh	S-D	CA	Kal
1	n-	ə-n-	(a-)c-	hɪn-	in-
2	is-	'a-, (la)	'ə-c-	ɪn-	an-
3	-s	-s	-s	-s	-s
P1	-yił	-č-ł	-č-ił	-æt	qe?-
P2	-yæla, -la	-ap	-l-ap	-mp	-mp
P3	-s, -agas	-s-awmš	-s'algwa?	-s-ɪlš	-s (with glottalization of preceding vowel)

Outstanding is the stability of the third person possessive -s, as it is in Salish languages other than those here considered. Here the plural endings of the third person, probably not pronominal at all, are comparable: Cheh P3 -awmš > S-D -'algwa? or -algwa? > CA -ɪlš. Kal plurals are marked by glottalization of the accented vowel.

n is again present in Cheh ən-, Till n-*my*, and absent in S-D (a-)c-; it reappears in CA hɪn- and Kal in- *my*. The function of S-D -c in (a-)c- *my*, and 'ə-c *your*, is unaccounted for, as is the appearance of h in CA hɪn- *my*.

3.3. The pronouns affixed to the verb, related to the independent and possessive pronouns, are treated differently. In all five languages pronouns of the completive-customary systems differ from those of the continuative system, either in form, position, or both. Pronouns of all systems differ in the intransitive, and transitive, active and passive voice. If the verb is intransitive in the completive-customary system, the pronouns involve only a subject, which in the third person is zero. If the verb is transitive active voice with an object, the object-subject elements are combined, though they are sometimes difficult to isolate because of contraction.

The subject pronouns of the intransitive completive-customary system are:

	Till	Cheh	S-D	CA	Kal
1	-i	-č-ən	-č-əd	č-ɪn-	č-in-
2	-š	-š	-č-ix^{w}	ku, ku^{a}-	k^{w}-
3	—	—, (-x)	—	—	—
P1	-yił	-č-ł	-č-ił	č-	qe?-
P2	-yæla	-ap	-č-iláp	ku-p-	p-
P3	—	(-yawmš)	(-'algwa)	(-ɪlš)	—(with glottalization)

In the first person Cheh -č-ən > S-D -č-əd; Till -i is aberrant so far as these languages are concerned.

The relation of second person Cheh -š to S-D -č-ix^{w} is probably of the type Cheh š > S-D x^{w}, but Cheh š may be a contraction of š and something related to č. But Cheh č seems to be characteristic of the first persons only.

The fact that the pronouns of this series are suffixes in the Coast languages, and prefixes in the Interior languages, suggests that the problem of position and the difference in the pronoun shapes are two separate questions. With the material now at hand the Boas-Haeberlin remark still holds: ". . . it is obvious that in the Puget Sound dialects special developments have taken place which are not included and explained by the more general principles of the k-č sound shift discussed. . . . From the material in our vocabularies it is not possible to formulate any principles concerning these exceptions, not to speak of determining the phonetic conditions that underlie them."[3]

3.4. Object and subject of the completive-customary system transitive active voice are suffixed to the verb and are in final position in all five languages, except Kal which has several prefixed objects.

The pronominal subject suffixes of the Coast languages are the same for intransi-

[3] IJAL 4:126, 1927.

tive and transitive active voice. In CA and Kal the subjects of the intransitive are prefixed to the verb; those of the transitive active voice are suffixed, and differ from the intransitive subjects.

Often the object-subject pronominal suffixes consist of a single sound, and they are so closely related to the rest of the verbal complex that they may become obscured by contraction with other parts of the complex. The suffixes of the Coast languages are either contracted less than those of the Interior, or they contract in ways so different as to allow checks on the formulas, and substantiation of CA theoretical forms.

Edel has analyzed the Till object-subject pronouns in two conjugations (Till pp. x, 30). She isolates the pronominal object suffixes as follows:

	1 conj.	2 conj.
1	-c	-iu-š
2	-c	-iu
3, P3	-n, -t	—
P1	-tiuł	-iuł
P2	-tiuł	-iuł

These combine with the pronominal subjects given above as follows; the analyses in parentheses are mine:

	1 conj.	2 conj.
1-2	-ƹ-i, -ƹa-i(<-t-c-i)	-(i)wi, -(i)wai(<-iw-c-i)
1-3	-n-i<-t-n-i	-i, -x̣ʷ-i(<-iw-x̣ʷ-i)
1-P2	-tiuł-i, -tiwil-i(<-t-iuł-i)	-iwuł(<-iw-iuł-i)
2-1	-č(<-t-c-š)	-iw-əš, -iw-šəš (<-iw-c-š)
2-3	-nš(<-t-n-š)	-š, -x̣ʷ-š(<-iw-š, -iw-ən-š, -iw-x̣ʷ-š)
2-P1	-tiułš -tiwilš(<-t-iuł-š)	-iw-ilš, -iw-ilš (<-iw-iuł-š)
3-1	-c(<-t-c-ø)	-iuš, -iwəš (<-iw-c-o)
3-2	-c(<-t-c-ø)	-iu-s(<-iw-c)
3-3	-n, -t(<-t-n-ø)	— (<-iw-n)
3-P1, P2	-t-iuł(<-t-iuł-ø)	-iuł<-iw-t-iuł
P1-2	-c-yił(<-t-c-yił)	-iu-yæł(<-iw-yił)
P1-3	-n-yił, -t-yił(<-t-yił)	-ił-yæł(<-iw-yił)

	1 conj.	2 conj.
P1-P2	-tiułiił, -tiwiłyæł (<-t-iuł-yił)	-iw-ił-yæł (<-iw-iuł-yił)
P2-1	-c-yæla (<-t-c-yæla)	-iuš-yæla (<-iw-c-yæla)
P2-3	-nyæla, -tyæla(<-t-n- yæla)	-yæla(<-iw-yæla) -x̣ʷ-yæla (<-iw-x̣ʷ-yæla)
P2-P1		-iu-ł-yæla (<-iw-iuł-yæla)
P3-1	-ƹælu(<-t-c-ælu)	-iu-š, -iw-alu (<-iw-c-?)
P3-2	-ƹiu(<-t-c-ælu)	-iu(<-iw-c-)
P3-P1	—	(-ilu, -iwilu) (<-iw-?)

From this analysis it seems that the difference is in the types of contractions rather than of pronouns. Apparently the first conjugation is indicated by a suffix, probably -t-, and the second conjugation by a suffix -iu-, or -iw-, each of which has a different effect on the following pronouns. Edel mentions a regular voicing process in which c- > ƹ; there is often voicing when c is followed by a suffix, but there seems to be more to the process than this, since it may involve the introduction of a vowel, the change of the vowel, as i to æ, and possibly a change of accent.

If the contractions are valid, the objects are: 1, 2 -c; 3 -n, -t; P1, 2 -uł.

We know from the analysis of kindred languages that -c *me* and -c *you obj.*, have different values: Cheh S-D -c *me*, but Cheh -cı, -ce *you obj.*; and S-D -cid *you obj*. We should expect then that these two persons would show different effects in combination, and Till confirms this conclusion by the forms P1-2 -cyił and P1-P2 -tiułiił, or -tiwiłyæł, and even more convincingly by 1-2 -(i)wi, or -(i)wai < -iw-c-i, 2-1 -iwəš, or -iwšəš < -iw-c-š; and 3-1 -iuš, -iwəš < -iw-c-ø; 3-2 -ius < -iw-c. Obviously w (u) can absorb c. We shall see that Till w > Cheh m which is also capable of absorbing c.

Though Edel states that there is no dif-

ferentiation between singular and plural third persons, the forms of P3-1 -ẓ-ælu and P3-2 -ẓiu, compared with 3-1 -c and 3-2 -c, show that a plural -iu or -ælu survives in some cases.

There is ample proof that Cheh -m- (< Till -iw-) and -stom (< CA -st-əm) are aspectual or other verbal suffixes, which as in Till, affect the pronominal suffixes, but do not constitute a separate pronominal series.

In his analysis of the Cheh text Boas gives three classes of completive pronominal suffixes, corresponding with the two conjugations of Till:

	OBJECT			SUBJECT
	I	II	III	
1	-c	-m-š	-sto-m-š	-čən
2	-c	-m-e	-sto-m-e	-š
3	-ən	-ɬ (?)	-xʷ	—
P1, P2	-toł	-m-oł	-sto-m-oł	-čł
P2	-toł	-m-oł	-sto-m-oł	-ap
P3	-ən-awmš	-ɬ-yawmš	—	-yawmš

Boas isolates the objects: 1 (-s), -š; 2 -e; P1, 2 -oł.

I have gone over the Cheh notebooks and made an analysis parallel with those of Till, S-D, CA, and Kal. From the analysis I would revise the object pronouns as follows: 1 -c; 2 -ce, -cə, -icə, -ice; 3 -n, -t; P1 -tol, -tolɬ; P2 -toł, -to·ɬ.

The Cheh object-subject suffixes combine as follows: 1-2 -ce-čən, -čə-čən < -t-ci-čən; 1-3 -ən-čən, -an-čən < -t-ən-čən; 1-P2 -t-oł-čən; 2-1 -c-č < -t-c-s; 2-3 -an-č < -t-an-š; 2-P1 -tolɬ-č < -t-oł-š; 3-1 -c < -t-c-o; 3-2 -ci, -cə < -t-ci-ø; 3-3 -ən, -t-ən < -t-ən; 3-P1, P2 -to·lɬ < -t-oł-ø; P1-2 -cə-čł < -t-cə-čł; P1-3 -ən-čł < -t-ən-čł; P2-1 -c-čap < -t-c-čap; P2-3 -čap < -tən-čap; P3-3 -in-amš < -in-yawmš.

From Edel's description of Till -t may be the verbal suffix corresponding with CA -t innate, but some examples indicate that it may be a personal object. The suffix -ən (-əd in S-D) seems to be a transitivizing element in all the languages, but it is so far impossible to explain why it appears sometimes, and at other times is lacking. Similarly, it is still not clear why -tən is used in contradistinction to -ən.

Since the completive object-subject suffixes of S-D do not often contract, they explain many of the forms of the other languages.

Tweddell includes several good paradigms with full forms (S-D 40-1):

	Object	Subject
1	-c	-čəd
2	-cid	-čixʷ
3	—	—
P1	-tubuɬ	-č-iɬ
P2	-tubuɬəd	-č-iɬáp
P3	-ʔalgwa	-ʔalgwa

Usually the object-subject suffixes are combined without contraction, the only contracted form being: 2-1 -c-čixʷ < -cid-čixʷ.

The type verbs cited are bádc-əb *deceive, lie*, and xaǰ-ub *like, desire, wish*; note that S-D -əb, -ub > Till -iw-, Cheh, CA, Kal -əm.

In all the languages a transitivizing element may obscure the third person object: Till -iw- (-wu, -awu), apparently distinct from -iw-conjugational suffix; Cheh -ən, -an (-in, -ən); S-D -əd; CA -ən, distinct from -in *attempt*; Kal -ən (-tén, -tən). This transitivizing element apparently affects the object suffix in combination, but its effects are only tentatively worked out and have not been included in the formulas so far given. It may account for the third person pronouns listed as either -n or -t.

In view of the fuller S-D pronominal forms in the same position as those of CA I now revise my interpretation of c as a completive, and consider it a part of the pronominal complex (cp. CA §§319 ff.). This means that the completive has no suffix, and the object-suffixes have contracted much more markedly than was apparent for CA alone.

The following list indicates the revised CA

object-subject suffixes with a comparison of the same forms in S-D:

	CA	S-D
1-2	-c-n	-cid-čəd
1-3	-n	-čəd
1-P2	-tulm-n	-tubułəd-čəd
2-1	-c-æxʷ	-c-čixʷ
2-3	-t-xʷ	-(t)-čixʷ
2-P1	(kuᵘ-...-šæš)	—
3-1	-c-æ-s	-c-ø
3-2	-cɪ-s	-cid-ø
3-3	-t-s	ø
3-P1	-tælɪ-s	-tubuł-ø
3-P2	-tulmɪ-s	-tubułəd-ø
P1-2	-cɪ-t	-cid-čił
P1-3	-t-m-æt	-(t)-čił
P1-P2	-tulmɪ-t	-tubułəd-čił
P2-1	-c-ælp	-c-čilap
P2-3	-t-p	-(t)-čilap
P2-P1	(kup-...-šæš)	

Even though the derivations are completely different from what I had assumed, except for the second person plurals, there would be no change in the forms I deduced for the subject pronouns of the completive active with object: 1 -n (< S-D -čəd); 2 -xʷ (< S-D -čixʷ); 3 -s (no equivalent in S-D, but probably the same in some Cheh forms); P1 -m-æt (probably no equivalent in S-D); P2 -p (-ælp) (perhaps < (-č-) -ilap).

Obviously -n *I*, which was unexplained by CA, is equivalent to S-D -(č)d; and -xʷ or -æxʷ *you*, is from -(č)ixʷ with the vowel change CA æ > S-D i.

We may expect to find many confusions in different languages and some of the CA forms seem to be more closely related to the possessives than to the subject pronouns; this is true of -s *third subject*, zero in S-D, and for P1 -mæt *we*, possibly also for P2 -p, -ælp.

If the isolation of the CA subject is correct, that of the object and c as the completive is wrong, especially for the first and second singular. The reason for the error is that too much weight was given to the vowel value, and I can think of no way by which one could ascertain the differences in value of -c- from CA alone. In the analysis of this brief set of pronouns c has three values: As a first person object (2-1, 3-1, P2-1) CA c is equivalent to Cheh -cɪ- *you obj.*, S-D -c (related in its turn to acə, əcə *I* independent pronoun, and to ac-, əc- *my*). As a second person object CA c is equivalent to S-D -cid (1-2, 3-2, P1-2). And as a combination of third person object-subject CA c is an affricative resulting from -t- 3 obj. plus -s- 3 subj. (3-3). The corrected object series should be: -c *me*; -c *you*; -t *him*; -tæl (šæš) *us*; tulm *you pl.*

For the discussion of Kal I have changed Vogt's 'possessor-agent (real subject)' and 'subject-patient (real object)' to conform with the formulas 'subject-object' used here (Kal pp. 33, 36, §§97–8). The Kal pronouns of the completive-customary system are compared with the same series of S-D:

	Kal	S-D
1-2	-c-ən, -c-ín	-cid-čəd
1-3	-ən, -tén	-čəd
1-P2	-łəm-ən, -łú-ləm-ən	-tubułəd-čəd
1-P3	-ən, -téʔn	—
2-1	ku-...-txʷ,-téxʷ	-c-čixʷ
2-3	-txʷ, -téxʷ	-(t)-čixʷ
2-P1	qeʔ-...-łelt, qeʔ-...-łú-łəlt	-tubuł-čixʷ
2-P3	-txʷ, -téʔxʷ	-(t)-čixʷ-'álgwa
3-1	ku-...-is, -tés	-c-ø
3-2	-c-s, -cís	-cid-ø
3-3	-is, -tés	ø
3-P1	qeʔ-...-łéls, qeʔ-...-łúləls	-tubuł-ø
3-P2	-łəms, -łúləms	-tubułəd-ø
3-P3	-is, -téʔs	-(t)-'álgwa
P1-2	-c-t, -cít	-cid-čił
P1-3	qeʔ-...-təm, -tém	-(t)-čił
P1-P2	-łəmt, -łú'ləmt	-tubułəd-čił
P1-P3	qeʔ-...-təm, -téʔm	-čił-'álgwa
P2-1	ku-...-t-p, -tép	-c-čiláp
P2-3	-t-p, -tép	-(t)-čiláp
P2-P1	qeʔ-...-łelt, qeʔ-...-łúlelt	-tubuł-čiláp
P2-P3	-t-p, -téʔp	-čiláp-'álgwa
P3-1	ku-...-is, -téʔs	-c-'álgwa
P3-2	-c-s, -cíʔs	-cid'álgwa
P3-3, P3-P3	-is, -téʔs	-(t)-'álgwa
P3-P1	qeʔ-...-łəl-s qeʔ-...-łúlels	-tubuł-'álgwa
P3-P2	-łəm-s, -łúləm-s	-tubułəd-'álgwa

The Kal pronouns correspond to some degree with those of CA, but a difference of treatment, and different results of contraction in some examples point to new types of relationships not yet encountered. In Kal two treatments of the completive verb are outstanding, possibly because of the phonetic composition of the stem. One type has the accent on the stem; the second type has the accent on the pronominal suffix, and in the third person plural the vowel of the suffix is glottalized.

The CA accent rarely falls on the transitive suffixes -ən (active voice) or -əm (passive), or on the pronominal suffix. These affixes often have an accent in S-D and Kal. Apparently the accent on such elements in S-D is an effect of contraction. In CA the echo vowel is a result of contraction, and in Kal it seems as if the accent is a function of contraction, although the rules must be quite different in the two languages.

For the completive Vogt gives the model verbs kup *push*, with the accent on the stem and the shortened unaccented suffixes, and u·l *burn*, with long vowel and the accent on the combination object-subject suffixes: kúp-ən-c-ən *I pushed you*, u·l-ən-cín *I burned you*.

It appears that S-D -čəd *I*, which becomes -n in CA, becomes -ən with the accented stem in Kal, but -tén with the unaccented stem. For instance, 1-3 kúp-ən *I pushed him*, but u·l-ən-tén *I burned him*.

Through a comparison of Kal and S-D I have arrived at the following isolation of completive object-subject pronominal suffixes:[4]

	Object	Subject
1	ku-	-ən, -tén
2	c	-tx^{w}, -téx^{w}
3	(-t)	-s, -is, -tés
P1	qe?-...-łəl, qe?-...-łúləl	-t, -tit
P2	-łəm, -łúləm	-tp, -tép
P3	(-t)-'	-s, -is, -te?s

The combined forms on the basis of this analysis results in: 1-2 -c-ən, -cín < -cs-tén; 1-3 -ən, -tén < -t-ən; 1-P2 -łəmən, -łúləm-ən; 1-P3 -ən, -té?n; 2-1 ku- . . . -tx^{w}, -téx^{w}; 2-3 -tx^{w}, -téx^{w} < -t-tx^{w}, -t-téx^{w}; 2-P1 qe?- . . . -łəl-t, -łúləl-t < -łəl-tx^{w}, -łúləl-tx^{w}; 2-P3 -tx^{w}, -té?x^{w} < -t-tx^{w}, -t-té?x^{w}; 3-1 ku- . . . -is, -tés < -ən-*trans.*-s, or -ən-tés); 3-2 -ts-s, -tsís < -ts-tés; 3-3 -is, -tés < -ən-*trans.*-t-s, or -ən-tés; 3-P1 qe?- . . . -łəl-s, -łúləl-s; 3-P2 -łəm-s, -łúləm-s; 3-P3 -is, -té?s < -ən-*trans.*-?s, or -ən-té?s; P1-2 -ts-t, -tsít < -ts-tít; P1-3 qe?- . . . -təm; P1-P2 -łəm-t, -łúləm-t; P1-P3 qe?- . . . -té?m; P2-1 ku- . . . -tp, -tép; P2-3 -tp, -tép < -t-tp, -t-tép; P2-P1 qe?- . . . -łəl-t, -łúləl-t < -łəl-tp, -łúləl-tp; P2-P3 -tp, -té?p < -t-tp, -t-té?p; P3-1 ku- . . . -is, -té?s < -ən-*trans.*-s, or -ən-té?s; P3-2 -ts-s, -tsís < -ts-té?s; P3-3, P3-P3 -is, -té?s < -ən-*trans.*-s, or -ən-té?s; P3-P1 qe?- . . . -łəl-s, -łúləl-s; P3-P2 -ləm-s, -łúləm-s.

Most of the unaccented pronominal suffixes are relatively clear. The following summarizes the effect of contraction of the accented syllables:

c-t > c-accent (1, 2, P1, P2, 1-2, 3-2, P1-2, P3-2).

Kal t > S-D -č (1-2, 1-3, 2-1, 2-3, 2-P3, P1-2, P2-1, P2-3, P2-P3).

The contraction of -ən-*trans.* with third person -s is well substantiated (CA §155, and Cheh qáx̣-an-s and qá·x̣as are equally acceptable for *his dog*, and there are verb forms exactly corresponding).

So far I have avoided the curious CA forms of 2-P1 ku^{u}- . . . -šæš and P2-P1 kup- . . -šæš; in Kal there are comparable forms:

Kal 2-P1 qe?- . . . -łəl-t > CA ku- . . . -šæš in which Kal qe?- > CA ku-, and Kal -łəl-t > CA -šæš.

The Kal suffixes of P1-3 qe?- . . . -tém and P1-P3 qe?- . . . -té?m may be related to S-D -tubuł, but the S-D form is an object and the Kal -tém a subject.

[4] Vogt's terminology is not entirely clear, although his chart is (Kal p. 36). He is probably trying to explain completive and continuative pronouns on the same basis, whereas the two series are distinct (Kal §90).

The comparative list of completive object-subject suffixes now follows:

	Till		Cheh	
	Object	Subject	Object	Subject
1	-c	-i	-c	-čən
2	-c	-š	-ce, -cə, -ice	-š
3	-n, -t	—	-n, -t	—
P1	-uɬ	-yiɬ	-tol, -tolɬ	-čɬ
P2	-uɬ	-yæla	-toɬ, -to·ɬ	-ap
P3	—	—	—	-yawmš

	S-D	
	Object	Subject
1	-c	-čəd
2	-cid	-čix^{w}
3	—	—
P1	-tubuɬ	-čiɬ
P2	-tubuɬəd	-čilap
P3	(-'algwa)	(-'algwa)

	CA		Kal	
	Object	Subject	Object	Subject
1	-c	-n	ku-	-ən, -tén
2	-c	-x^{w}	-c	-tx^{w}, -téx^{w}
3	-t	-s	(-t)	-s, -is, -tés
P1	-tæl (-šæš)	-mæt	qe'-...-ɬəl, -ɬúləl	-t, -tít
P2	-tulm	-p (-ælp)	-ɬəm, -ɬúləm	-tp, -tép
P3	—	(-ılš)	(-t)-'	-s, -is, -té?s

Edel has some difficulty in placing -x^{w}- as a pronoun, and Boas has the Cheh oppositions: ıt óx-ən ıt məns *he saw his own son*; ıt óx-tux^{w}t ıt məns *he saw his (someone else's) son*. As long as examples are restricted to third persons it seems as if Till x^{w} and Cheh tx^{w}(t) are a sort of obviative, a means of distinguishing a first from a second third person. Other examples hardly allow this interpretation: Till gu-t'un-óx^{w}-i *I'll come back with you*; Cheh twe-tx^{w}t-čən *I shall make her my wife*. These are not object-subject suffixes, but suffixes of reference corresponding with CA -ɬ- *for, instead of*. The Cheh forms would therefore be interpreted: ıt óx-tux^{w}t ıt məns *he saw (the other's) son instead of him (the father)*; ıt co·ntx^{w}t ıt pa·sóns *he told her instead of him*; twe-tx^{w}t-čən *I shall take care of her instead of him*.

The transitive pronominal system is applied to the completive-customary aspects as shown for CA. In CA, Kal, and probably Cheh, the forms are comparable, whatever their meaning. In CA the customary is formed by the frame æc- . . . -stem-, and in Kal by the frame es- . . . -stem- (Vogt calls it resultative). The same combined pronominal affixes are used; but the suffixes, being affected by -stem, are contracted as follows: 1-2 -stəm-ən < -stəm-c-ən, -stúm-ən < -stəm-cín; 1-3 -stən < -stəm-ən, -stén < -stəm-tén; 2-1 ku- . . . -stx^{w} < -stəm-tx^{w}, ku- . . . -stéx^{w} < -stəm-téx^{w}; 2-3 -stx^{w} < -stəm-tx^{w}, -stéx^{w} < -stəm-téx^{w}; 3-1 ku- . . . -sc < ku- . . . -stəm-s, ku- . . . -stés < ku- . . . -stəm-tés; 3-2 -stəms < -stəm-c-s, -stúms < -stəm-tsís; 3-3 -sts < -stəm-sts, -stés < -stəm-tés; P1-2 -stəmt < -stəm-c-t, -stúmt < -stəm-cít; P1-3 qe?- . . . -stəm < -stəm-təm, qe?- . . . -stém < -stəm-tém; P2-1 ku?- . . . -stəp < ku- . . . -stəm-tp, ku?- . . . -stép < ku- . . . -stəm-tép; P2-3 -stəp < -stəm-tp, -stép < -stəm-tép; P3-1 ku?- . . . sc < ku- . . . -stəm-s, ku?- . . . -sté?s < ku- . . . -stəm-té?s; P3-2 -stəms < -stəm-c-s, -stú?ms < -stəm-cí?s; P3-3 -sc < -stəm-s, -sté?s < -stəm-té?s.

-əm of *customary* -stəm- is lost when it is followed by a pronominal suffix that is not a result of contraction involving historical syllable loss (1-2, 2-1, 3-1, 3-3, P2-1, P2-3, P3-1, P3-3); these forms are in contrast to 1-2, P1-3.

In view of Vogt's discussion several remarks about further contractions are in order; the generalizations of this analysis clarify some of his formulations which may seem to be irregularities, or exceptions, and even eliminate some of his classes and subdivisions: Kal §69 (dependent form class IV, b) and §§94b, 95 may be omitted -stən is a combination of -stəm- and other elements otherwise accounted for; it represents an

aspect, not a class or subclass. The forms of Kal §§70, 78, 87, 88, 93, 96 with -š- and -ɬ- are not related to the completive or customary (Vogt's resultative). The examples given by Vogt for the customary (§97) involve stems ending in n: kʷen *take hold of one obj.*, iɬən *eat*; n in Kal as in CA assimilates to following s.

All five languages have a trace of a passive. Till has only a third person passive -u, -atu, -iu, which seems to be related to the third person plural, if indeed the forms are not the same (Till §52). Possibly they are impersonal forms. Edel notes that all persons of the passive, save the third, are expressed by English active constructions: *I was caught* > *they caught me*. At best passive completive is weakly developed in the Coast languages except in Cheh.

Cheh seems to have full passive forms, characterized by the suffix -əm or -təm, and followed by the subject pronouns (intr. and tr.): 1 -təm-čən, -čəm; 2 -təm-č (probably -təmš); 3, P3 -əm, -təm, -aˑtəm.

From Tweddell's discussion of the S-D passive, we conclude that the third person active, probably completive and continuative, is -tub > Cheh, CA, Kal -təm.

The completive-customary passive pronominal suffixes of CA and Kal are:

	CA	Kal
1	-cælæm	ku-...-təm, -tém
2	-c-ɪt	-c-t, -cít
3	-təm	-təm, -tém
P1	-tæl-ɪt	qeʔ-...-ɬəl-t, -ɬúɬəl-t
P2	-tulm-ɪt	-ɬəm-t, -ɬúləm-t
P3	-təm-ɪlš	-təm, -téʔm

In the light of the new material I revise my statement that the CA object of the active voice becomes the subject of the passive (CA §§339–40). All suffixes are preceded by the transitivizer -ən, except the Kal forms with initial ɬ, presumably -ən-ɬ > ɬ (P1, P2) (CA §156).

The customary pronouns contract with the customary suffix -stəm- as follows:

	CA	Kal
1	-stmælæm < -stm-cælæm	ku-...-stəm < -stəm-təm
2	-stmɪt < -stm-cɪt	-stəm-t < -stəm-c-t
3	-stəm < -stəm-təm	-stəm < -stəm-təm
P1	-stælɪt < -stəm-tælɪt	qeʔ-...-ɬəl-t < -stəm-ɬəl-t
P2	-stulmɪt < -stəm-tulmɪt	-ɬəm-t < -stəm-ɬəm-t
P3	-stəm-ɪlš < -stəm-təm-ɪlš	-stəm

Vogt has k'úl'-št-ən *I made it for him*, in the same series as the customary. It is really a completive; Vogt and Tweddell failed to isolate -šit (-št-) *for, as a favor to*, as a pronominal suffix (Kal §70, CA §564). This suffix precedes the pronominal object-subject suffixes in the same position as -ən- transitivizer, being substituted for it.

The comparative summary of the passive shows that it is well developed in the Interior languages as compared with those of the Coast; Cheh belongs with the Interior languages in this respect.

	Till	Cheh	S-D
1		-təm-čən, -čəm	
2		-təm-č (-təmš?)	
3, P3	-u, -atu, -iu	-əm, -təm, -áˑtəm	-tub

	CA		Kal	
	Completive	Customary	Completive	Customary
1	-cælæm	-stmælæm	ku-...-təm, -tém	ku-... -stəm
2	-cɪt	-stmɪt	-ct, -cít	-stəmt
3	-təm	-stəm	-təm, -tém	-stəm
P1	-tælɪt	-stælɪt	qeʔ-...-ɬəlt, -ɬúɬəlt	qeʔ-... -ɬəlt
P2	-tulmɪt	-stulmɪt	-ɬəmt, -ɬúləmt	-ɬəmt
P3	-təm-ɪlš	-stəm-ɪlš	-təm, -téʔm	-stəm

AN OUTLINE OF SHAWNEE HISTORICAL PHONOLOGY

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0. Introduction
1. Single consonants and semivowels
2. Consonant clusters
3. Vocalic syncope
4. Simple vowels
5. Semivowel combinations
6. The position of Shawnee in CA

0. The purpose of this paper[1] is to show the development of Shawnee from Proto-Central Algonquian (PCA) and to place Shawnee in the Central Algonquian language group. Only the phonological development is considered, though morphology cannot be entirely ignored.

A brief discussion of Shawnee phonology is in order.[2] Shawnee phonemes are of three types: consonants, semivowels and vowels. Note that /y/ and /w/ are not considered consonants, but are considered a distinct class. This classification eases our statements on the development of certain types of sequences.

Consonants	p (P)	t (T)		č	k (K)	
		θ		š		
						?
	m	n, l				
Semivowels	w				y	
Vowels	i	o				
	e	a				

/P/, /T/ and /K/ are defective phonemes, /P/ found only before /p/, /T/ only before /t/ and /č/, and /K/ only before /k/. We have no examples of these phonemes in our cognate sets. [?] and [h] are listed as allophones of the same phoneme but in the Stem List[3] Voegelin uses both symbols even though he still regards them as members of one phoneme. We will use the orthography of the Stem List.

The distribution of the phonemes in Shawnee is similar in most respects to that of the other CA languages. Vowels occur both long and short, but never long in final position. A vowel must close the word. Vocalic syncope has produced a large number of consonant clusters not found in PCA. Almost any consonant may be the first member of a cluster, but only voiceless consonants may be the final member.

The morphophonemic alternations in Shawnee are about the same as those for PCA. The exact nature of the alternations will become obvious in the following sections. There is an alternation between short vowel and zero, and long vowel and short vowel (vocalic syncope) peculiar to Shawnee. This is discussed below.

All examples for PCA are taken from Bloomfield, Siebert and Voegelin.[4] Bloom-

[1] The present paper was prepared before C. F. Hockett's paper Central Algonquian Vocabulary: Stems in /k-/ appeared in this journal (IJAL 23.247–268, 1957). Few revisions would be necessary, but a fuller statement could have been made if his material had been included, especially in regard to syllable initial *e and semivowel combinations.

[2] C. F. Voegelin, Shawnee Phonemes, Language 11.23–37 (1935). All examples of Shawnee are taken from C. F. Voegelin, Shawnee Stems and the Jacob P. Dunn Miami Dictionary, Indiana Historical Society, Prehistory Research Series, 1.63–108; 135–167; 289–341; 345–406; 409–478, Indianapolis (1937–1940); we will refer to this publication as the Stem List. For a short sketch of some aspects of the language see C. F. Voegelin, Productive Paradigms in Shawnee, in Essays in Anthropology in Honor of Alfred Louis Kroeber, pp. 391–403, Berkeley (1936).

[3] Stem List, p. 64.

[4] Leonard Bloomfield, On the Sound-System of Central Algonquian, Language 1.130–156; Bloomfield, Algonquian, Linguistic Structures of Native

field intended the forms to represent PA rather than PCA. We follow Hockett in regarding them as reconstructions of PCA.[5] Hockett also points out that these reconstructions may have to be modified when all the CA languages are considered. By and large Shawnee fits into the system well. When there are problems, there are at least two explanations: (1) there is some change peculiar to Shawnee which we have not been able to explain, or (2) Shawnee reflects distinctions which are not accounted for in the reconstructions. For the present we assume the first explanation wherever possible since we lack sufficient evidence to suggest any changes in PCA.

Often we have not been able to find the proper morphological forms to compare. Where possible, we have compared single morphemes, but often the phonology is influenced by the environment of a contiguous morpheme. In such cases, we symbolize the set as though the two forms were comparable, i.e., as *ABC > abd, if the area between the morphemes a and b is under consideration.

Often, especially with nouns, Shawnee lacks a final syllable of the PCA form. I assume that these are morphological rather than phonological changes, but we cannot be sure since we still lack a Shawnee grammar.

1.1. The Shawnee reflexes of the PCA consonants and semivowels are as follows:

PCA			Shawnee		
p	t ~ č	k	p	t ~ č	k
	θ ~ š			l ~ š	
	l	s		l	θ
m	n		m	n	
w	y		w,h	(y)	
h	ø (vowel initial)		h(ʔh)	h	

Examples: *p: *pem- *along in space or time* > pem-; *-pahtoo *run* > ptoo.

*t: *-tempi *brain* > (-)tepi; *nekotwi *one* > nekoti.

*č: *keqčikamyi *sea* > kčikami.

*k: *kečky- *old* > kk-; *kešy- *hot* > kiš.

*θ: *aθaankwa *star* > halaakwa; *θenčyee- *finger* > leč-.

*š: *kešyii- *speedy*, cp. kiši?ka (prob. from kišii + -?ka) *fast*; *kiišekatwi *it is day*, cp. kiišeki *it is day*.

*l: *lee- *breathe* > lee-; *nalakačkwi *my palate*, cp. laka?kwa (change of gender) *palate, washboard*; *-eele *think* > -eele.

*s: *sak- *seize* > θak-; *saak- *protrude* > θaak.

*m: *pem- (see above); *miit- *defecate* > miiθi, miiči- (Shawnee shows the old alternation of *t ~ *s in this morpheme).

*n: *neqθwi *three* > nθwi; *kenw- *long* > kinw-, kin.

PCA *t ~ *č and *θ ~ *š before *i and *y. *č is limited to this environment; *š is not thus limited, but is found most often in this environment. This alternation is reflected in Shawnee by t ~ č and l ~ š, but only when found before PCA *i and *y, as in: *nexkaači, *nexkaatali *my leg-s* > nkaači, nkaatali. But note *one* (see above); and *keqtwikaani *farm*, cp. ktika (pl. ktikaana) *field*. The alternation of *θ ~ *š is reflected differently when *θ is a member of a consonant cluster (see below).

1.2. The remaining nonsyllabics require special comment. *w remains in medial position: *meqšyeewi *it is big* > mšaawi (this form has been reshaped, but the reshaping involves only the sequence *-yee-). Initial *w before long vowels remains

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America, Viking Fund Publications in Anthropology 6.85–129 (1946); F. T. Siebert Jr., Certain Proto-Algonquian Consonant Clusters, Language 17.298–303 (1941); C. F. Voegelin, Proto-Algonquian Consonant Clusters in Delaware, Language 17.143–147 (1941). We will refer to the two Bloomfield items as Lang. and the Sketch, respectively. We use the orthography found in the Sketch, except for these changes: for *çk, *θk, *xp we use *šk, *tk, *tp. Bloomfield's *θk and *xp show parallel development in the CA languages, and, in many cases, are *tk and *tp morphophonemically.

[5] Implications of Bloomfield's Algonquian Studies, Language 24.117–131 (1948).

(*wii-, *waa-, *wee-): *wiit- *with* > wiit-; *wiiqs- *pain, bitter* > wi?θ *bitter*; *wiikiwaami *house* > wiikiwa; *waap- *white* > waap-. I could find no sure examples reflecting *wee-.

*we-, *wa- (*wo- and *wi- are not found in PCA) > ho- probably pre-Shawnee *o-: *wetpenya *potato* > ho?penya *sweet potato*; *wekimaawa *chief* > hokima; *welaakani *dish* > holaaka; *wemp- *upward* > hop-; *wešk- *new, young* > hošk-; *we- *3rd pers. pron. pref.* > ho-; *watkani *bone* > ho?kani; *walakeetkwa *bark* > holake?kwi (change of gender).

We have not been able to find any good examples of *y. However, cp. *wiiyawi *his body* and wiyaw?θi *meat* (prob. wiyaw(i)- + a formative -?θi); the short /i/ in the Shawnee form is unexplained. PCA also has a root *awiy- in *awiyaka *someone*, and *awiyali *some* (*other*) *one*; cp. Shawnee wiyee- *generic thing, person*, as in wiyehi *something*, wiyeeθa *somebody*, which is probably related to the PCA form in some manner even though it is not directly cognate since the loss of the initial vowel would be unparalleled. It would thus seem that there are special problems with *y, but they will be hard to solve since *y is a rare phoneme in PCA except in clusters.

1.3. Initial vowels of PCA > hV: *ametkwa *beaver* > hame?kwa; *akw- *be on, adhere* > hakw- *up on top*; *eemeHkwaani (consonant cluster uncertain) *spoon* > heem?kwa. Note that *h does not occur in initial position according to Bloomfield's system, but he states that several of the languages have a non-phonemic [h] onglide before initial vowels.[6]

*h > h (or ?h). Voegelin states "Underlying -?h- is implied wherever intervocalic -h- or voiceless consonant plus -h- occurs; -?h- is actualized after voiced consonants and also before -w-".[7] Examples: *nahaanka *son-in-law* > nhaakana (cf. nin?haakanema *my son-in-law*); *-ahi *obv. pl. suff.* > -hi, -?hi; *-teehi *heart* > -tehi.

2. The second member of a consonant cluster develops in the same manner as a single consonant, except that when *θ *l and *s are preceded by *q or *h, they yield θ. The cluster *nl yields n (we have no examples of *nθ or *ns).

There are eight phonemes which can occur as the first member of a consonant cluster in PCA. They can be grouped into four sets in terms of their distribution in PCA and their development in Shawnee: (1) nasal (*m before *p, *n elsewhere), (2) *h and *q, (3) *x *t and *č, and (4) *s and *š. The first two sets are found before *č *s *θ *š and *l. All four sets are found before *p *t and *k; however there are some holes in the system, some probably due to lack of data. Of those that occur we have examples in Shawnee for all but *hp *čp *št *hč *ns and *nθ. Set (1) > C, leaving no trace in vocalic syncope. Sets (2) and (3) > ?C. Set (4) > šC.

When, through syncope, a cluster of the type ?C comes to stand after a voiceless consonant, ? is lost. If it comes to stand after a voiced consonant, ? is lost in initial position but remains elsewhere. When a cluster of the type šC comes to stand after a voiced consonant, ? is inserted between the voiced consonant and š in non-initial position. When h comes to stand after a voiced consonant, ? is inserted between the voiced consonant and h in non-initial position.

Examples: *p as second member: *wemp- *upward* > hop-; *wetpenya *potato* > ho?penya *sweet potato*; *ešp- *high* > šp-.

*t as second member: *wiintamwa *he names it*, cp. niwiita *I named it*; *-pahtoo *run* > ptoo; *-htoo *tran. final, inan.* > -?to, cp. *pooñihtaawa *he ceases from it*, nimiin?ke?to *I got seeds from it*; *meqtekwi *tree* > mtekwi (-m?tekwi in non-initial position).

*k as second member: *aθaankwa *star* >

[6] Lang., p. 146.

[7] Stem List, p. 340. /??/ and /hh/ are used in Voegelin's other publications.

CHART 1

Set 1 *n:	*mp > p	*nt > t	*nk > k	*nč > č	*ns > (?)	*nθ > (?)	*nš > š	*nl > n
Set 2 *h:	*hp > (?)	*ht > ?t	*hk > ?k	*hč > (?)	*hs > ?θ	*hθ > ?θ	*hš > ?š	*hl > ?θ
*q:	...	*qt > ?t	...	*qč > ?č	*qs > ?θ	*qθ > ?θ	*qš > ?š	*ql > ?θ
Set 3 *x:	...	...	*xk > ?k					
*t:	*tp > ?p	...	*tk > ?k					
*č:	*čp > (?)	...	*čk > ?k					
Set 4 *s:	...	...	*sk > šk					
*š	*šp > šp	št > (?)	*šk > šk					

halaakwa; *ehkwa *louse*, cp. waapi?kwa *louse* (prob. < *waap- *white* + *ehkwa); *mexkwamya *ice* > mkwama (-m?kwama in non-initial position); *watkani *bone* > ho?kani; *meskw- *red* > mškw- (-m?škw- in non-initial position); *kiišk- *to cut through, sever* > kišk-.[8]

*č as second member: *θenčyee- *finger* > leč-; *keqčikamyi *sea* > kčikami.

*s as second member: *nemihsa *my older sister* > nimi?θa; *nikwiqsa *my son* > nikwi?θa.

*θ as second member: *oohθali *his father*, cp. no?θa *my father*; *neqθwi *three* > nθwi (non-initial -n?θwi).

*š as second member: *neškiinšekwi *my eye* > nškiišekwi; *wemehšoomehsali *his grandfather*, cp. nime?šoom?θa *my grandfather*; *šiiqšiipa *duck* > ši?šiipa.

*l as second member: *wiinleewa *he names him*, cp. niwiina *I named him*;[9] *leehleewa *he breathes* > le?θe; *pemiqleewa *he flies along*, cp. pem?θeeki *they fly*.

Chart 1 summarizes the development of clusters. We write the resultant cluster in pre-Shawnee, which in most cases is a morphophonemic notation.

The PCA alternation of *θ ~ *š is reflected by θ ~ š when in clusters. Compare (-)m?θ-, (-)m?š- *big* < *meqθ-; či?θ-, či?š- *fear* (PCA form unknown, but prob. *čiiqθ- or *čiihθ-).

3. Under certain conditions vowels are syncopated or shortened before consonant clusters but it is not possible to make a completely adequate statement because Shawnee morphophonemics are yet to be stated. No syncope takes place before *nC clusters; this cluster developed into a single consonant before syncope took place. Only clusters of the type ?C and šC are involved (new clusters arising through syncope do not cause further syncope).

Long vowels were shortened before clusters. This statement is also descriptively valid, as in le?θe *he breathes* (lee- + -?θee) and leewe *she has poison breath* (lee- + -we).

Examples: *wiiqθenyiwa *he eats* > wi?θeni; *šiiqšiipa *duck* > ši?šiipa; *kiišk- *to sever, cut through* > kišk-; *walakeetkwa *bark* > holake?kwi; *wiitpeewa *he sleeps with someone*, cp. niwi?peema *I sleep with him*.

Short vowels are sometimes syncopated before clusters. The principal conditioning factor seems to be the consonant which precedes the vowel. If the preceding consonant is voiced (m, n, or l < *m, *n, *l or *θ) and if the cluster is of the type ?C, there is an alternation between short vowel and zero. It is not known what the conditions are for this alternation. Some morphemes are cited with only one form. We suspect that more examples of the morphemes which lack the alternates would yield the expected alternates.

Examples: *-netki *arm* > (-)ne?ki, -n?ke; *meqθ- *big* > (-)m?θ, (-)m?š-, me?š-;

[8] One form does not fit: *axki *land*, cp. hašiški *land* and also Kickapoo aškihki *dirt*. Probably more than one prototype is involved.

[9] This is the only example we have of *nl. It is possible that the form was reshaped. Cp. *wiintamwa *he names it*, niwiita *I name it*. The transitive final *-nl, *-nt (or *-l, *-t, depending on where the segmentation is made) is rare, and reshaping seems unlikely.

*θeqθeemaawa *tobacco* > (-)la?θeema, (-)l?θeema; *maxkesini *shoe* > (-)ma?kiθe, (-)m?kiθe, -a?kiθene; *mexkwamya *ice* > (-)m?kwama; *nexkaači *my leg* > nkaači, *neqθwi *three* > (-)n?θwi; *meqtekwi *tree, stick* > (-)m?tekwi (cp. also (-)m?tekwa, (-)me?tekwa *bow, gun*).

There are only three examples of initial *w- before a short vowel plus cluster. In all three cases the vowel remains: *watkani *bone* > ho?kani; *wetpenya *potato* > ho?penya; *wešk- *new, young* > hošk-.

When a short vowel is in initial position before a cluster of the type ?C we find the same alternation as above when preceded by a voiced consonant. There are only three examples: *axkehkwa *kettle* > ha?ko?kwa, (-)hko?kwa, -akkwa;[10] *aθk- *watch, lie in ambush* > ha?kaw-, (-)hkaw- *waiting for, anticipating*; *eθkweewa *woman* > hkwee-, (-)y?kwee- (this form is difficult; Voegelin[11] states that the form with y may reflect an alternation with h common in reduplication of stems, as seen in yeeyakw- from hakw-).

When a voiceless consonant precedes a short vowel + cluster—we can find cognates only with the cluster of the type ?C in this environment—, the vowel is syncopated. Examples: *netaxkehwa *my kettle* > nitko?kwa (note that the second cluster does not fit this formulation; cp. -akkwa, above); *-oohšihs- *grandchild* > hošθe-; *keqt- *big* > kt; *koq- *to fear*, *koqθeewa *he fears him* > kw-, nikwθa *I'm afraid of him* (this is the only example of *-o- > interconsonantal -w-; interconsonantal -w- counts as zero in these formulations);[12] *peqt- *by accident, error* > pt-. But *nalakačkwi *my palate*, cp. laka?kwa *palate, washboard*; *-kwiqsa *son* > (-)kwi?θa, (-)kwθ-; and *axkehkwa (see above) do not fit this formulation.

A short vowel before a šC cluster is syncopated, except in the one example noted above when the short vowel was preceded by initial *w-. Examples: *meskw- *red* > mškw-; *neškiinšekwi *my eye* > nškiišekwi; *eškoteewi *fire* > škote; *ešp- *high* > šp-.

If a short vowel is syncopated after a cluster of the type ?C, ? is lost: *-oohšihs- *grandchild* > hošθe-; *axkehkwa *kettle* > -akkwa. We can find no cognates with a šC cluster in this environment.

Vowels, either short or long, are syncopated before h. For examples, see above (**1.3**).

4. There is no change in the simple vowels except that syllable initial *e > either i or e. Otherwise *i > i, *ii > ii, *e > e, *ee > ee, *a > a, *aa > aa, *o > o, *oo > oo. These correspondences are amply illustrated in the examples given above.

We have only two examples of initial *e. There are no examples in the Stem List of he- (but there are a few examples of hee-). Initial hi- alternates with -te- after pronominal prefixes. In initial syllables after a consonant Shawnee has both e and i for *e. There are not enough examples to find any conditioning factor if one exists.[13]

Examples: *elen- *ordinary*, cp. hileni *man*; *eθ- ~ *eš- *thus*, so > hil-, hiš- *belonging to self*[14] (alternating with -tel-, -teš-; cf. also nil-, niš- alternating with -tel-, -teš- *so, thus, in general*); *kenw- *long* > kinw-, kin-; *kešy- *hot* > kiš-; *ne- *first person pref.* > ni-; *ke- *second person pref.* >

[10] [h] seems to contrast with [?] in these examples. It may be that Voegelin used a morphophonemic notation, but if so, it is unexplained.

[11] Stem List, p. 433; see also the Sketch, p. 93.

[12] See Hockett's latest paper (op. cit., 1957), no. 98, and Mary R. Haas, Notes on some PCA Stems in /k-/, IJAL 24.241–45 (1958).

[13] Bloomfield points out (Lang. p. 133) that in initial position PCA had only *i, but in initial syllables when after a consonant only *e. In the Sketch we find Bloomfield used *e throughout in initial syllables.

[14] While the meaning does not seem to fit as well as one would want, the forms are perfect. Some of the examples given by Voegelin show a semantic link, as nitelaapowe? to *I flavored it like wine*, niteleθi *I am of such a nature myself, have my own characteristics*. Others like niteleθite *I have a foot* and nitelaapama *I had my eyes on him* show a semantic change.

ki-; *pem- *along in space or time* > pem-; *nepyi *water* > nepi; *nekotwi *one* > nekoti.

The bold-face vowel in the following forms is unexplained: *axkehkwa *kettle* > ha?**ko**?kwa; *maxkesini *shoe*, cp. ma?**ki**θ**e** -a?**ki**θ**e**ne; *θeqθeemaawa *tobacco* > la?θeema.[15]

5. There are not enough examples of semivowels in combination with the various consonants and vowels to make a complete statement.

*Cyi, *Cyii > Ci, Cii. *nepyi *water* > nepi; *-kamyi *liquid* > -kami; *kešyii- *speedy*, cp. kiši?ka *fast*.

*Cyaa, *Cyee > Ciyaa, Ciyee, except when *C is *č or *š: *nyaalanwi *five* > niyaalanwi; *-myaa- *smell* > -miyaa-; *pyee- *to come, bring* > piyee-; *nyeewwi *four* > niyeewi.

The development of sequences involving *Cya, *šy and *čy cannot be stated at this time. We have too few examples and most of those involve singular and plural formations which have been reshaped in Shawnee. However, there are no examples in the Stem List of šiy- plus long vowel or čiy- plus long vowel. Thus we can be sure that *šy- plus long vowel and *čy- plus long vowel do not develop in the same manner as other *Cyaa, *Cyee combinations.

*Cw + vowel remains in most cases: *ametkwa *beaver* > hame?kwa (pl. hame?kwaki); *axkehkwa *kettle* > ha?ko?kwa (pl. ha?ko?kooki);[16] *-kwaam- *sleep* > -kwaam-; *meqtekwi *tree, stick* > mtekwi; *neqθwi *three* > nθwi; *nyaalanwi *five* > niyaalanwi; *niišwi *two* > niišwi; *-hkweekani *neck*, cp. -?kweekaka *neck*; *kwiiθ-omeewa *he longs for him*, cp. kwiilaa-, kwiila- *failure in getting*.

*twi > ti: *nekotwi *one* > nekoti; *keqtwikaani *farm*, cp. ktika *field*.

6. In his first article, Bloomfield[17] classified Sauk, Fox, Kickapoo and Shawnee in one group, the Sauk group. Later Bloomfield placed Shawnee in a group by itself.[18] It is clear that Shawnee has more in common with the Sauk group than with any of the other groups treated by Bloomfield, and must be considered a member of that group. Shawnee, Fox and Kickapoo have almost identical clusters. Fox and Kickapoo have [h] as first member of clusters where Shawnee has [?]. However, both Fox and Kickapoo have simplified clusters with *s *l *θ and *š (Proto-Sauk *s and *š) as second member. Nasal clusters are simplified in the three languages. Proto-Sauk *s (< PCA *s, as well as *θ and *l when second member of a cluster) > s in Fox and θ in Shawnee and Kickapoo. Fox and Kickapoo merge not only PCA *l and *θ, but *n as well. Also, Fox, Kickapoo and Shawnee are among the few languages that preserve the final vowels of PCA.[19]

[15] Compare also Fox ahkohkwa, Kickapoo ahkohkooki (pl.); see Bloomfield's remarks, Sketch, p. 86. The PCA form *θeqθeemaawa and Shawnee la?θeema may come from a root **-qθeemaa-, with some PCA languages showing one type of reduplication, Shawnee, and perhaps others, showing another habit of reduplication. This is only a guess; there is no evidence for such an interpretation. The form -a?kiθene is a non-initial doublet, lacking the indefinite prefix *m-. The final -e of this form follows the pattern of a large number of non-initial doublets, and hence is in no way irregular. Compare (-)tooni *mouth*; (-)telya *shoulder*; wiikiwa *house*; (-)ne?ki *arm*; (-)kwani *heel*; (-)nowa *cheek*; (-)?kweekaka *neck*; and the non-initial doublets for these forms: -tone; -telye; -w-ika, -w-ike; -n?ke; -kwane; -anowe; -?kweekane, -?kwe, -kwe-. Perhaps the /e/ in the penult of -a?kiθene is to be explained in this same fashion; and the /e/ in ma?kiθe, reformed on the analogy of -a?kiθene.

[16] I cannot explain why *beaver* and *kettle* have different plural forms since both forms are presumably from *-aki. Note the plural of *tree* mteko, sing. mtekwi.

[17] Lang., p. 130.

[18] Sketch, p. 85.

[19] The Kickapoo material available to me is a short vocabulary taken by Mary R. Haas. See also William Jones, Algonquian (Fox), Handbook of American Indian Languages, BAE 40, pt. 1, p. 740 (1910).

AN ACOUSTIC ANALYSIS OF SHAWNEE: III*

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2.2. Consonantic sequences
2.3. Terminal spectra
3. Duration
3.1. Duration of spectrum units
3.1.1. Duration of vocalic segments
3.1.2. Duration of consonantic segments
3.2. Duration of amplitude contours
3.3. Spans
4. Amplitude
4.1. Overall configuration

2.2. In addition to single segments of uniform consonantic spectrum, stretches of consonantic spectrum occur which, because of variety in the type of spectrum, can be considered consonantic sequences. In general, consonantic sequences have a duration range between fifteen and thirty-five centiseconds. We have observed forty-eight specific sequences.

When consonantic sequences occur intervocalically, an initial or final member can be identified, first by the type of spectrum, and second, and often more specifically, by its effect on the formants of approaching or following vowels (just as with a single intervocalic consonant). These points offer a basis for comparison and identification with consonants described in isolated occurrence (**2.1.**): Sequence-medial segments, in consonantic sequences of three members, on the other hand, must be identified primarily on the basis of spectrum alone, and at times secondarily on the basis of mutual influences with the preceding and following consonants.

2.2.1. We list two and three member sequences (1) with a plosive first member, (2) with a fricative first member, and (3) with a resonant first member.[1]

(1) Sequences with initial plosive: Two-member sequences are of two general types, plosive-plosive (S_1S_2) and plosive-fricative (SF). Typically, the plosive-initial interval is followed by a brief spike, similar to the release spike of a pre-vocalic plosive; the second member is equal to or slightly longer than the first in duration.

I. S_1S_2. The two members are of approximately equal duration, the sequence averaging about twenty centiseconds. The following sequences of this type have been noted: (k_1t), (k_2t), (k_2p).

II. SF. The fricative member is usually longer by a few centiseconds than the plosive. We have noted (ps), (ts), (tθ), (th), (k_2s), (k_1s), (k_1h), ($k_1\theta$).

Three-member sequences with plosive as first member belong to the general types S_1S_2F, S_1FS_2 and SF_1F_2. In such sequences, the second member seems usually to be the shortest. In the second type, the two plosives are generally of approximately equal duration; in the third, F_2 is longer than S.

III. S_1S_2F. Examples are (pts), ($k_1$ts).

IV. S_1FS_2. (pht), (phk$_2$), (tsk$_1$), (thk$_2$), ($k_2$hp), ($k_1$ht), ($k_2$ht).

V. SF_1F_2. ($k_2$hs), (tsθ).

(2) Sequences with initial fricative: We have observed two-member sequences of the following patterns: FS, F_1F_2, and FR. Typically, the initial fricative is somewhat longer than the second member of the sequence.

VI. FS. The following have been noted: (st), (sk$_1$), (sk$_2$).

VII. F_1F_2. (sθ), (θh).

VIII. FR. (sm), (sn), (sl).

* For Part I and II see IJAL 24.20–29 and 24.130–42.

[1] Our corpus is not nearly large enough to include all possible consonant sequences, which are, relative to individual consonants, infrequent in occurrence. Comparison with a list of phonemic clusters suggests that the following classification is representative and expansible.

(3) Sequences with initial resonant occur with and without simultaneous glottalization (glottalization is indicated for the resonant first member; at times, however, the glottal effect continues into or through a fricative second member). Two-member sequences of the following types occur in the data observed: RS, R?S, RF, R?F, R_1R_2. The two segments are usually about equal in duration; however, a fricative second member may be as much as half again as long as the initial resonant.

IXa. RS. The two segments are brief and approximately equal in duration; total duration is about fifteen centiseconds The following are noted: (nt), (np).

IXb. R?S. The glottalized resonant is slightly longer in duration than the plosive; the total duration of such sequences is about 25 centiseconds. Examples noted are: (m?p), (m?k_2).

Xa. RF. The fricative is somewhat longer than the resonant segment. The total duration is about 20 centiseconds. Examples noted are: (nh), (ls).

Xb. R?F. The two segments are about equal in duration, with a combined duration range of 20 to 30 centiseconds. Examples noted are: (m?s), (m?θ), (m?h), (n?θ), (l?θ), (l?s).

XI. R_1R_2. Sequences made up of resonants range between 15 and 25 centiseconds in total duration. The segments tend to be approximately equal in duration, except for (l), which is relatively brief when it is the second member of such a sequence. We have noted: (mn), (lm), (nl).

One three-member sequence with initial resonant has been observed, following the pattern R?FS. The three members are approximately equal in duration; the sequence totals about 30 centiseconds. The example is (m?sk_2).

2.2.2. We briefly describe features of specific consonants, in pre- and post-consonantic occurrences as noted in the sequences just listed, which may be compared with the descriptions of intervocalic spectra in **2.1.**

p: Post-consonantic *p* lacks harmonic elements in the spectrum. Pre-plosive *p*—before *t* and *k*—has a strong release with power at approximately 500, 12–1500, 18–2200 and 2700 cycles, similar to the distribution before a front vowel. Pre-fricative *p* has no clear release spike.

t: Post-consonantic *t* lacks harmonic elements in its spectrum. *t* is not noted as preceding other plosives; before fricatives the release is at times absent or indiscernible (or merges with the fricative pattern); when present, the most consistent maximum is around 1000 cycles, with secondary power at 2000 and/or 3000. The widest distribution is apparently before (θ), at 500 to 1500, and at 2000 cycles. Again, the distribution—when release power is present—is similar to that before a front vowel.

k: Post-consonantic *k* lacks harmonic elements in its spectrum. k_1 before plosives (*t* only) has release power widely distributed, with the maximum above 2000 cycles. Before fricatives, the release is also diffuse, with the maximum at about 2500 before *s* and θ, around 3000 before *h*. k_2 before plosives (*p* and *t*) has release energy concentrated below 1500 cycles. Before *s* it is below 1300, with the maximum about 700 cycles. Before *h*, release energy is not separable from the fricative spectrum.

s: Post-consonantic *s* lacks harmonic elements except when, rarely, harmonic power appears to continue through a preceding plosive to the beginning of the *s* [e.g., often in (ts)]. Post- and pre-consonantally the usual *s* spectrum has resonance bands at 2000, 3000 and 3500 cycles. The first resonance bar is bent down toward the second formant of adjacent resonants [noted in (sm), (ls) and (m?s)], and by other fricatives [noted in ($k_2$hs), (sθ)].

θ: Post-consonantic θ generally lacks harmonic spectrum. Noise spectrum is usually stronger than that of intervocalic θ, but absent in the lower frequencies.

The concentration of power in the post-consonantic spectrum is approximately at 2000, 3000 and above 45–5000. The placement of the lowest of these concentrations seems the most variable, apparently falling, below 2000 after *t* and *s*, as high as 2600 after k_1. Like intervocalic θ, the spectrum is strongest at onset, power diminishing with time.

h: Post-consonantic *h* generally has a wide distribution of power; when pre-vocalic, this becomes concentrated segment-finally in the vicinity of vowel formant frequencies (as described above, **2.1.7**). In general, there is some power above 500 to 1000 cycles, up to about 2000, and another concentration around 3000. A resonance bar usually stands out in the lower concentration; after and before the plosives, *s* and θ (the Cx group), the location of this bar seems to be influenced by the F2 hub of the consonant—bent down to around 1000 by *p* and k_2, around 2000 adjacent to *t* and *s*, bent up to or toward 3000 by k_1. After resonants, the *h* friction is traceably connected with the second formant of the resonant and with that of a following vowel; as with intervocalic *h*, harmonics may be continuous from a preceding resonant to a following vowel.

m: Pre- and post-consonantic *m* has formants at approximately 400 and 1300 cycles. The second formant may be bent up or down by preceding or following vocalic segments, but consonant environment seems to have little influence.

n: Pre- and post-consonantic *n* generally has a first formant at about 4–500 and a second at 1800 cycles. As in the case of *m*, environment seems to have little influence, *n* formants are continuous with those of adjacent vowels.

l: Consonant-adjacent *l* seems to have a first formant at about 500, a second varying from 1400 to 2000 cycles, relatively low before *m* and *h*, relatively high before *s*. (These segments are few and often unclear, however.)

2.3.1. We have in preceding sections described spectra of consonantic and vocalic segments as if Shawnee speech consisted simply of segments of these two general types, of generally comparable duration, in unending sequence. We now want to describe terminal features and, thus, to delimit the broader segmentation(s) of the language.

First of all, one can note features characteristic of the absolute beginning and ending of speaking—the one preceded, the other followed by large amounts of silence. Our recorded corpus is further divided into primary (and given) segments defined by the operator's turning the recording machine off and on; but the length and content of the spans thus delimited are determined by the informant's desire to begin and cease speaking.[2] Thus we have a large number of relatively brief segments each of which can be considered a separate speech event, each with a beginning and end.[3] If we note characteristics of onset and termination of speech and find these features—or some of them—also WITHIN the duration of the speech event, contrasting with the more usual kind and sequence of spectra, then we will consider these occurrences as similar (if not identical) in kind to those occurring at absolute termini, i.e., as marking additional terminal points.

2.3.2. At the termination of speaking the typical occurrence is a noise spectrum which gradually fades to silence, or fades until suddenly interrupted by the termination of recording.[4] The noise spectrum has a fricative pattern, fairly generally distributed, with darker resonance bands standing out;

[2] Actually, the informant prompted the onset and termination of recording herself, by manual signals.

[3] Whether duration and/or terminal features as found in the corpus are valid for ordinary Shawnee speech does not concern us at this point; see **6.2.**

[4] Indicating, perhaps, that the speech event was so obviously complete that recording was terminated.

some, at least, of the resonance bands are traceable from the frequency of formants of a preceding vowel, and usually progress with time toward a middle frequency location. The intensity of the spectrum and the elapsed time before fading (and thus the final position of resonance bands) are variable.

Medially in the speech event, the gradual fade to silence is rarely completed. Rather, the fricative spectrum (1) is suddenly terminated after its intensity is somewhat diminished. The silent interval which follows can be followed by (2) another stretch of noise spectrum (identified as inhalation), or by (3) a speech-initial segment (see below, **2.3.3**), which can also follow (2).

(1) Vowels preceding the terminal fricative are affected in the following ways: *a*, *o*, and *e* first formants rise, while second formants do not seem to be affected. Both first and second formant of *i* appear to rise. Thus the general pattern is the same as with medial *h*. The rise of the *i* first formant is an exception; we were not able to be specific concerning the effect of intervocalic *h* on *i* (see **1.2.4**).

The fricative spectrum generally has power above 700 to 1000 cycles. The spectrum is most concentrated following *o*, most diffuse following *i*. Resonance bands stand out fairly clearly; a lower band begins usually at or above the level of the first formant of the preceding vowel. Another band appears continuous with the second formant of a preceding vowel. After *e* and *i*, an intermediate band at approximately 1500 cycles may appear and show a strong spectrum. A fourth band, at about the frequency of vowel F3 may also be discernible.

Following *a*, fricative power is distributed between approximately 800 and 2000 cycles, with strongest concentration between 1000 and 1400. Resonance bars, continuous with formants 1 and 2 of *a*, progress from 1000 and 1400 to merge with the maximum at about 1200 cycles. A traceable band may later diverge from this concentration and progress to about 1600 cycles (if the spectrum is not interrupted). Following *o*, the pattern is similar to that following *a*. Power is concentrated between 800 and 1200 with resonance bands progressing from 800 and 1000–1100 to converge at approximately 1000. A second bar may later appear at 1600 cycles.

After *e*, power is distributed roughly between 500 and 2000 cycles, and there may be some above 2500. The first bar rises from about 700 cycles, approximately continuous with the first formant of *e*, to 1000; the second from about 1800, more or less level, terminating at 2000 or slightly lower. The intermediate area, with a resonance bar which appears at about 1500 cycles, becomes the strongest part of the spectrum as the other areas fade. Following *i*, power is present above about 500 cycles. The first resonance bar begins somewhat higher than the first formant of *i*, at about 700–800 cycles; others continue F2 to about 2800, F3 to about 3300 cycles. Again there is an intermediate bar at 1500–2000 cycles, toward which the third bar may appear to bend. The frequencies around 900 and 3000 cycles generally remain the strongest parts of the spectrum, however.

In general, the beginnings of these terminal fricative segments appear similar to *h* conditioned by whatever vowel precedes; the resonance bands then continue unidirectionally—that is, with no compensating influence by a following vowel. In the case of *a*, *o* and *e* this amounts to a lower resonance bar rising to or toward the frequency of the second. The tendency in the case of *i* may be similar. A second tendency, toward final concentration of energy in the middle frequencies—with maximum concentration ranging from 1000 by 1600 to 1200 by 2000 is achieved, following back vowels, by a slight dispersion of the already merged spectrum, and after front vowels by a fading of the upper and lower fre-

quencies and the growing prominence of intermediate spectrum.

(2) In a slightly different final sequence, friction may be already present in the upper frequencies of the vowel segment, with harmonic spectrum in the middle and lower frequencies. Such vowels seem to be generally briefer and the following frictional segments weaker and briefer than is typical of those described above. This pattern has especially been noticed with *i* and *e* (in the other vowels the upper frequencies may not stand out clearly, especially if the spectrum is relatively weak and so the contrast might not be noticed).

The formant paths and location of resonance bands are as already described. The upper frequency friction continues into the terminal segment, while the harmonics terminate and friction begins in the lower frequencies.

2.3.3. At the onset of speaking some inhalation or other light frictional spectrum may be present. Any such is suddenly terminated, and there is silence of roughly ten to forty centiseconds' duration. This is followed by (a) stop release or (b) a brief stretch of distinctive consonant spectrum or (c) sudden onset of vocalic spectrum. Medially in the speech event, fricative spectrum of either a preceding terminal segment or an intervening inhalation spectrum is suddenly terminated, followed by an interval of silence and sound beginning as here described.

We take the silent interval preceding sound as belonging to the phrase-initial segment. Following this, stops are identified by typical release bar spectra and effects on the formants of following vowels. *p*, *t*, k_1 and k_2 have been noted initially. Initial resonants have, following silence, spectra of about two to three centiseconds' duration. The spectrum is brief, and often slightly blurred, so that formants can rarely be traced. Therefore, though initial spectra can be classed as resonants, the adjacency effects on the following vowel spectrum identify individual resonants. *m*, *n* and *l* have been noted initially. Initial *h* may be identified by a light distribution of fricative power, 3 or 4 centiseconds in duration, preceding the onset of vowel spectrum and distributed as conditioned by the following vowel. However, fricative spectrum is not always discernible. Thus, the typical bending of vowel formants, plus or minus characteristic spectrum, identifies initial *h*. *θ* has not been noted initially. One example of initial *s* shows a stronger spectrum than *h* (as also medially) and approaches the average for medial *s* in duration.

Initial consonantic sequences are rare in the corpus. In SF sequences, the stop is identified by its release; the fricative member has typical spectrum but seems to be generally briefer than in phrase-medial occurrence. We have noted *ts*, k_1s, *th*. Initial RS has a resonant not as brief as when prevocalic initial, with sudden and slightly glottalized onset; the stop is of normal intervocalic duration. E.g. *nt*.

Initial vocalic spectrum has sudden onset with vowel formants at the *w* or *y* maximum position as conditioned by a following vowel, or, rarely, at vowel maximum. The spectrum has concurrent glottalization in the latter case.

2.3.4. In summary, then, the typical manner of ending and beginning phrases, both speech terminally and speech medially, in our Shawnee corpus is as follows. For the first, the usual phrase-final is a fricative spectrum, occurring post-vocalically, which is in its onset similar to *h* conditioned by the preceding vowel, which diminishes in energy with time, and whose spectrum tends to become more and more concentrated in middle frequencies (a focal area being roughly between 1000 and 2000 cps.). The energy of this spectrum may simply fade, or it may be interrupted; some fricative spectrum, in any event, precedes the stretch of silence typical of the onset of speech. At phrase-initial, noise spectrum is sharply terminated and silence maintained

for generally 10 centiseconds or longer. Transitions from silence to sound are identified with various consonants already described phrase-medially: Stops are identified by release and following adjacency effects; fricatives by adjacency effects and, usually, by a brief stretch of distinctive spectrum; resonants by distinctive spectrum plus adjacency effects; and vocalic units by formant position.

2.3.5. Less frequent sequences can be regarded as deviations from the typical pattern as described above (**2.3.1–4**):

(1) Glottalized phrase-final: glottalized vocalic or resonant spectrum may gradually terminate in silence, which is maintained until the onset of consonant spectrum as if after the usual phrase-initial silent segment. In this case there is no terminal noise spectrum.

(2) Non-speech initial segments: An unusual noise spectrum, e.g. a cough or sigh, follows the terminal spectrum and immediately precedes speech. A following consonant or vowel has the spectrum characteristics of a medial segment.

3.1. We will first discuss the duration of segmental units as defined on the basis of spectrum (see above, 1 and 2); second, the duration of contours, as delimited on the basis of amplitude patterns (see below, **4.1**); and finally will look for criteria for the establishment of isochronous duration units (spans).

3.1.1. a) General information: We have already included a certain amount of information on duration of vocalic segments in presenting the qualitative sample. It is schematically summarized below:

I. VOCALIC SEGMENTS: duration range: less than 5 to over 75 cs. (**0**)

A. VOWELS: *a* range: 6–21 cs.; average 9.75 cs. (**1.2.1**); *o* range: 5–18 cs.; average 10 cs. (**1.2.2**); *e* range: 6–18 cs.; average 8.7 cs. (**1.2.3**); *i* range: 6–16 cs.; average 8.6 cs. (**1.2.4**).

B. VOCALIC SEQUENCES (**1.3.1–2**): *wa* range c. 12–16 cs; *we* range c. 12–16 cs; *wi* range approximately 10 cs; *wey* range c. 18–24 cs; V*w*V range c. 22–28 cs; *ye* range c. 10–12 cs; *ya* range c. 16–18 cs; *yo* range c. 12–18 cs; *ay* range c. 14–18 cs; *ey* range c. 10–18 cs; V*y*V range c. 20–30 cs; Complex vocalic sequences; longest measured, 76 cs.

TABLE 1

Duration (in cs.)	Quality	Number of Segments			
		Single-quality	Double-quality	Triple-quality	Total
3	i	1			1
5	i, o	2			2
6	a, e, o, a, e, e, i	7			7
7	e, e, a, e, a, e, a, i, ey	8	1		9
8	a, i, e, a, a, a, a, i, i, i, e	11			11
9	o, a, i, e, e, wa, wa	5	2		7
10	o, a, a, i, i, i, o, we, we	6	3		9
11	o	1			1
12	i, e, a, ye	2	2		4
13	o, a, i, i, i, e, e, ye	6	2		8
14	i, i, e, a, e	4	1		5
15	i, i, i, i, a, ye	5	1		6
16	a, e	2			2
18	o, e	2			2
22	owe			1	1
25	iwe			1	1
26	owe, owa, ye		1	2	3
28	aye			1	1
		62	13	5	80

C. GLOTTALIZED VOCALIC SEGMENTS: V? c. 10–20 cs. (**2.1.12**).

b) Vocalic segments in a connected sample: In the tape section 2535–2547 (spectrograms 1–15), vocalic segments range in duration between 3 and 28 centiseconds. The list of non-glottalized vocalic segments in Table 1 illustrates the qualitative distribution over this duration range.

VOWELS: The distribution of single-quality segments over the duration range

suggests that there are two frequency clusters, the first with its mean at about 7.5 cs., the second at c. 14.5 cs. Thus we can propose two degrees of quantity, the greater approximately double the duration of the lesser. We will provisionally call those which fall in the range 5–10 (or 11) cs. *single-quantity vowels* (V, = 1 quantitative unit) and those in the range (11 or) 12–18 cs. *double-quantity vowels* (V·, = 2 units). However, we must suspect that some segments in the vicinity of 10–13 cs. are intermediate or indeterminate in quantity.

SEMIVOWELS: The chart includes double and triple-quality non-glottalized vocalic sequences. Double-quality sequences are sparsely distributed over a wide distribution range and may not differ materially in their distribution from single-quality segments. However, the concentration seems greatest in the intermediate range and we might suggest that, ideally, VS and SV sequences have a quantitative value of 1.5 (between single and double).

Triple-quality segments cover a range between 22 and 28 cs., with the greatest concentration at 26. The range is, thus, approximately triple the duration of single-quantity vowels.

Thus, the majority of non-glottalized vocalic segments in this sample fall in the following framework:

	dur. mean		quant. units
V	7.5	(*8)	1
VS, SV	11	(*12)	1.5
V.	15	(*16)	2
VSV	25	(*24)	3

GLOTTALIZED VOCALIC SEGMENTS: The sample of these segments is small, but it is appearent that glottalized vowels and vocalic sequences are, on the whole, longer in duration than qualitatively similar non-glottalized segments. Apparently the lengthening effect adds to the duration of the segment approximately 4 to 8 cs. (or the equivalent of a brief vocalic or consonantic unit). Thus, *o·* may = 16 cs.; *o·ʔ* = 24 cs.; *ye* = 13 cs.; *yeʔ* = 19 cs.

3.1.2. a) General information: Information which has already been given about consonant duration is summarized below.

II. CONSONANTIC SEGMENTS. duration range: approximately 5 to 40 cs. (**0**).

A. SINGLE CONSONANTS. (a) Stops, range: 7–20 cs. (**2.1**). *p* range: 7–17 cs.; average: 11.3 cs. (**2.1.1**); *t* range: 9–17 cs.; average: 13 cs.; modes at 10 and 15 cs. (**2.1.2**); *k* range: 7–14 cs.; average 9.3 cs. (**2.1.3**). (b) Fricatives, range 6–17 cs. (**2.1.8**).; *s* range: 6–17 cs.; average 13.5 cs. (**2.1.5**); *θ* range: 7–16 cs.; average 11.5 cs. (**2.1.6**); *h* range: 6–16 cs.; average 10 cs. (**2.1.7**); modes suggested at 7 and 12 cs. (c) Resonants, range 5–15 cs. (**2.1.12**). *m* range 6–15 cs.; average 8.5 (**2.1.9**); *n* range: 7–12 cs.; average: 8.7 (**2.1.10**); *l* range: 5–10 cs.; average: 7.7 (**2.1.11**).

B. CONSONANTIC SEQUENCES (**2.2**). (a) 2 member sequences: S_1S_2: $S_1 = S_2$ (e.g. 10 + 10 = 20 cs.); SF: S ≦ F (e.g. 8–10 + 10–15 = 18–25 cs.); FS: F > S (e.g. 12 + 10 = 22 cs.); F_1F_2: $F_1 > F_2$ (e.g. 12 + 10 = 22 cs.); FR: F > R (e.g. 15 + 6 = 21 cs.); RS: R = S (e.g. 7 + 7 = 14 cs.); RF: R < F (e.g. 8 + 12 = 20 cs.); R_1R_2: $R_1 \geqq R_2$ (e.g. 10–15 + 10 = 20–25 cs.). (b) 2 member sequences with glottalization: RʔS: Rʔ ≧ S (e.g. 10–15 + 10 = 20–25 cs.); RʔF: Rʔ = F (e.g. 12 + 12 = 24 cs.). (c) 3 member sequences: S_1S_2F: $S_1 \geqq S_2 > F$ (e.g. 8–12 + 8 + 7 = c. 22–28 cs.); S_1FS_2: $S_1 > F < S_2$, $S_1 = S_2$ (e.g. 10 + 5 + 10 = 25 cs.); SF_1F_2: $S > F_1 < F_2$, $F_2 > S$ (e.g. 7 + 5 + 12 = 24 cs.). (d) 3 member sequence with glottalization: RʔFS: Rʔ = F = S (e.g. 10 + 10 + 10 cs.).

b) Consonantic segments in the connected sample: Table 2 gives a rough picture of the duration range of consonant segments in this sample (spectrograms 1–15).

It can be seen that in general resonants are relatively brief units (concentrated between 8 and 11 cs.). The fricative *s* is most often relatively long, with most occurrences above 15 cs. *h* is usually inter-

mediate in duration, between 10 and 13 cs., or short (3–7 cs.) The other units, plosives and *θ*, are widely distributed, from relatively brief (7 cs.) to relatively long (16 cs.).

RESONANTS: The following list shows the distribution of resonants over their duration range. The majority of occurrences of the three non-glottalized resonants clearly forms a single distribution group, with some suggestion of a second longer quantitative type (15 cs.) for *l*).[5] The mean is approximately 9.5 cs., slightly lower for *l*, slightly higher for *n*. The deviation is slight and we have at present no environmental explanation for it, except for the very brief segments which occur contour-initially.

duration	m	n	l	m?	total
2		2			2
8	4	2	3		9
9	2	1	7		10
10	4	3	2	1	10
11		3			3
12				1	1
13				1	1
15			1		1

As with vocalic segments, glottalized resonants appear to be longer than non-glottalized. *m*? in this sample has the duration range 10–13 cs., as compared with *m*, 8–10.

DURATION OF S: The following list shows the distribution of s-segments in this sample over a duration range of from 10 to 23-centiseconds.

duration	number of segs.
10	1
11	2
15	1
16	1
17	1
20	2
23	1

The briefer group, (10–11 cs.) all occur as second members of SF (ts) sequences.

[5] Overlong or double quantity *m* has been observed, though not in the corpus directly used.

TABLE 2

Duration (in cs.)	Quality	Number
3	n, n, h	3
5	h	1
6	h	1
7	l, *θ*, h	3
8	m, m, m, m, n, n, l, l, l	9
9	m, m, n, n, l, l, l, l, l, l, l, *θ*, t, k	14
10	m, m, m, m, m?, n, n, n, n, l, l, s, s, h, h, h, h, t, t, k, k, k	22
11	n, s, t	3
12	m?, *θ*, h, p, p, t, k	7
13	m?, h, t, t, k, k, k, k, k	9
14	*θ*, *θ*, *θ*, l, t, k, k, k, k	9
15	s, h, p, k, k	5
16	s, t, k	3
17	s	1
20	s, s	2
23	s	1
		—
		93

Three of the four in the range 17–23 cs. occur in double-quantity vowel environment (V·CV·). Intermediate segments occur initially in an F_1F_2 sequence (16 cs.) and following V? (15 cs.).

DURATION OF H: The following list summarizes the distribution of h-segments in this sample:

duration	number
3	1
5	1
6	1
10	4
12	1
13	1
15	1

The relatively brief group, (3–6 cs.), includes one interconsonantic occurrence in an S_1FS_2 sequence, and two phrase-initial occurrences (which are difficult to measure but obviously brief). The group between 10 and 15 cs. are all intervocalic;

qualitative factors in the environment do not offer any obvious explanation for the variation. (We might note that it is often difficult to decide where to segment between *h* and an adjacent vowel, so that some variation may be due to the arbitrariness of this decision.)

DURATION OF P, T, K, *θ*: The table summarizes the distribution of these segments over the duration range.

duration	θ	p	t	k
7	1			
9	1		1	1
10			2	3
11			1	
12	1	2	1	1
13			2	4
14	3		1	2
15		1		2
16			1	1

The brief *θ* and the *t* segments, in the vicinity of 10 cs., occur in F_1F_2 and SF sequences. Other occurrences, most of them intervocalic, seem to cluster at approximately 10 and between 12 and 16 cs. In the case of *θ*, it appears that this variation is conditioned by quantitative environment, relatively brief segments following single-duration vowels, relatively long segments following double-duration vowels and glottalized resonants.

The pre-nasalized portion of these segments (called harmonic decline in section 4) varies in duration independently of total duration. This may be brief (5 cs. or less) or may continue throughout the segment, up to the onset of the following vowel. At least partly co-variant, the silent (or minimum amplitude) part of the segment, between the termination of nasalization and stop release or vowel onset, may be of several centiseconds' duration or instantaneous. We note below that amplitude level throughout these segments is affected by amplitude of adjacent segments. As part of the same picture, the duration of the harmonic decline seems to be positively affected by long duration of a preceding vocalic segment and by relatively high amplitude at the onset of the plosive (or *θ*) segment.

3.2. Contours[6] in the continuous sample vary in duration between approximately 15 and 100 cs. The briefest are in segmental composition VCx,[7] while the longest contain sequences of vocalic and resonant segments.

Duration of contours roughly corresponds to the number of segmental units of which they are composed, as 1 unit: 10 centiseconds' duration. Two-member contours range between 15 and 25 cs.; three-member between 25 and 40 cs.; four-member between 35 and 45; six-member between 50 and 65; etc.

3.3. The present aim is to delimit a provisional duration unit which can serve as a basis for statements about speech-rhythm and metre. Taking the longest contours (see **3.2**) as a primary unit (with a mean duration of approximately 90 cs.) we note that it is often possible to group two or more of the briefer contours into compound units of similar duration. This grouping process can be continued until most or all of an utterance is contained in approximately isochronous units (which we will call *spans*) with, at times, brief phrase-initial or final contours remaining.

4.1. The amplitude profile of a stretch of Shawnee speech, in our sample, consists of one or more segments of curving line (contours) terminated, initially and finally, by intersection with a horizontal base-line (silence).[8] Such a contour has almost always a steep—almost vertical—onset slope, a more gradual decline. A simplified geometric model of a brief contour is a right triangle with its right angle at the point of onset, the vertical leg being the initial

[6] See **4.1.**

[7] Cx = p, t, k, s, *θ*.

[8] 'Silence' must be taken relatively; the actual height of the amplitude minimum varies with instrument setting and the placement of the base-line.

rise in amplitude, the sloping hypotenuse the final decline. In most contours a relatively high level of amplitude is maintained—a plateau containing minor rises and falls—after the steep initial rise and before the final sloping decline.

A phrase is usually made up of a succession of several contours. In long, complex contours sudden downward shifts in amplitude, rapid variation in amplitude level, and other occurrences specific to individual sound units complicate this generalized picture somewhat; however, these longer contours can often be visualized as containing a succession of truncated contours of the simpler type (the tendency to steep onset and gradual decline remaining obvious).

In the sample under consideration (spectrograms 1–15) contour peaks (amplitude maxima) for the most part coincide with vocalic (vowel, semi-vowel) and fricative (s) segmental units. Steep rises from baseline to maximum, or near maximum, amplitude coincide with harmonic (vocalic, resonant) segments, phrase-initially or following a phrase-medial minimum. Amplitude minima coincide with stops and fricative (*θ*) segments; glottalized segments approach or attain minimum amplitude; and minimum amplitude precedes the onset and follows the cessation of speech.

PALEOSIBERIAN ETYMOLOGIES: I

DEAN STODDARD WORTH

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0. Kinship terms in Kamchadal
1. Immediate family
2. Grandparents, grandchildren
3. Uncle, aunt, nephew, niece, cousin
4. Husband, wife, in-laws
5. Man, woman, boy, girl
6. Miscellaneous

0. Linguistic descriptions of Northeast Siberia usually join the Chukchee, Koryak, and Kamchadal languages into one group termed Chukchee or Luoravetlan (*true man*, the Chukchees' name for themselves).[1] The opinion is no longer generally held that this Chukchee group is genetically related to other so-called Paleosiberian (Paleoasiatic) languages such as Gilyak, Yukaghir, Ket, etc., but its relation to such physically distant groups as Uralic (especially Samoyed), Basque, Tibetan, and the Indian tongues of Northwest or even Central America continues to be discussed a good deal.[2] Chukchee, Koryak, and Kamchadal forms are confidently cited for comparative purposes, and the casual reader, browsing through some of the far-reaching and undoubtedly interesting conclusions drawn from such comparisons, might well assume that these cited forms had been more or less firmly established within each of the languages in question before being used for external comparison. This not unreasonable assumption unfortunately has no basis in fact, at least in the case of Kamchadal. The scanty descriptive material on Kamchadal is superficial in all respects and ignores etymology completely.[3] The few available word-lists are in several dialects the interrelations of which have never been established nor the distinctions between which even described.[4] No single Proto-

[1] Roman Jakobson, "Langues paléosibériennes", Les langues du monde, Paris, 1952, p. 403; S. N. Stebnickij, "Itel'menskij jazyk", Jazyki i pis'mennost' paleoaziatskix narodov, edit. E. A. Krejnovič (= Jazyki i pis'mennost' narodov severa, III, Moskva-Leningrad, 1934), p. 86; Waldemar Bogoras, "Chukchee", Handbook of American Indian Languages by Franz Boas, Part 2, pp. 631–903; Roman Jakobson, Gerta Hüttl-Worth, John Fred Beebe, Paleosiberian peoples and languages, a bibliographical guide, New Haven, 1957, p. 219.

[2] e.g. by Johannes Angere (Juho Ankeria), "Das Verhältnis der tschuktschischen Sprachgruppe zu dem uralischen Sprachstamme", Språkvetenskapliga Sällskapets i Uppsala Förhandlingar, 1949–51, pp. 109–150; the most wide-ranging comparisons have been made by Karl Bouda, cf. "Tibetische Etymologien", Orbis V, 1, 1941, "Tschuktschisch und Finno-Ugrisch", Lingua, IV, 3, 1956, p. 286f., and esp. "Die Verwandtschaftsverhältnisse der tschuktschischen Sprachgruppe", Acta Salmanticensia, Filosofia y Letras, V, 6, 1952.

[3] Some grammatical data on Kamchadal are given for comparative purposes in W. Bogoras, "Chukchee"; this material was partially systematized and in a few respects supplemented in S. N. Stebnickij, "Itel'menskij jazyk". There are several pages of grammatical remarks among the Jochelson manuscripts in the New York Public Library (s. Avrahm Yarmolinsky, "Kamchadal and Asiatic Eskimo Manuscript Collections, A Recent Accession", Bulletin of the N. Y. Public Library, Nov., 1947); this and other material therein is now being prepared for publication.

[4] It is usually assumed that there were originally three Kamchadal dialects, Northeast, South, and West; word-lists for these areas are given in S. P. Krašeninnikov's fundamental work Opisanie zemli Kamčatki, 1st ed. S.P.b., 1755, 4th ed. (used here), Moskva-Leningrad, 1949, p. 444f.; closely related are many words from the village Uka, given with Krašeninnikov's Koryak lists p. 461f.; these lists are abbreviated here as Kraš 444, Kraš 461. Much more complete lists were collected over a century later by Benedykt Dybowski and published by Ign. Radliński, "Słowniki narzeczy ludow Kamczackich", Rozprawy Akademii Umiejętności, wydział filologiczny, Serya II, I, 53–217 (Northeast), II, 103–122 (Southern), III, 81–164 (Western), Krakow, 1892, also separately (used here, each list paginated 1-); abbreviated here Radl II, III, IV (I = an Ainu glossary, V =

Kamchadal word has ever been reconstructed, nor has it ever been demonstrated that there even was a unified Proto-Kamchadal language, distinct from Proto-Koryak and Proto-Chukchee. In short, there is at the present time no justification for using Kamchadal material in wide-ranging comparative studies. The present paper, devoted to the comparison and analysis of all available Kamchadal kinship terms, offers a first modest step toward the detailed internal reconstruction that has to precede any valid external comparison. Only Kamchadal forms are discussed, with occasional Koryak parallels cited.

The proposed reconstructions are of varying degrees of dependability. The certainty with which a particular root can be reconstructed obviously depends on the amount of comparative material available; in some cases this is so inadequate that the cited forms must be regarded with caution, if not with outright suspicion (e.g. spuxt *daughter-in-law*, occurring only once in South Kamchadal), but in others there is little room for doubt (e.g. pe, pa *child*). West Kamchadal forms are generally more reliable than others, since the Jochelson Mss.[5] make many more examples available and were in addition recorded by a more experienced investigator than Krašeninnikov, for example.

Comparison of Kamchadal kinship terms from the point of view of their dialectal distribution reveals the striking fact that of the eighty-odd roots used to form the approximately one hundred thirty recorded kinship terms, only a bare dozen occur in more than one of the three dialect areas and only three or four in all three areas. Of the forty-three kinship relations attested in Kamchadal, there are twenty-one for which we have terms attested in all three areas. Common to Northeast, South, and West Kamchadal are only pe, pa *child*, səx(k) *sister-in-law*, probably ngə *wife*, and perhaps (u)xəč, čix *girl, woman*. Northeast and South are opposed to West Kamchadal by the terms NE, S nak (pl.) *men* :: W čamza etc.; NE, S ep, ip, ap *father* :: W isx (W epc, epe JK2.32 is a Koryak borrowing in Sedanka); perhaps NE kils, S kins *younger brother* :: W imtx. Northeast and West are opposed to South Kamchadal by NE, W tyj *brother* :: S kutaxuška. South and West are opposed to Northeast Kamchadal by S, W suging *daughter* :: NE čidepeč; S, W mitx *grandparent* :: NE ak; S, W kivs *uncle* :: NE costanom. In many other cases there is a different term in each area, e.g., NE ile, S a:d, W tlusx *aunt*; NE kračič, S ka:txacič, W txlo *old woman*. Of course,

Koryak, cf. below). A much smaller list, apparently from the South Kamchadal area, is given in Martin Sauer, An account of a geographical and astronomical expedition to the northern parts of Russia . . . by Commodore Joseph Billings . . ., London, 1802, Appendix II, abbreviated here Sauer App. A number of kinship terms from the Northeast and Western areas are included in the lists and discussions of Adolph Erman, Reise um die Erde durch Nordasien und die beiden Oceane in den Jahren 1828, 1829 und 1830,r Este Abtheilung, Dritter Band, p. 428f., abbreviated here Erman NE, Erman NW. Other sources used in this paper include the Koryak lists in Krašeninnikov, op. cit., abbreviated Kraš 461 (Kor Nom = nomadic or northern Koryak, Kor Sed = newly sedentary Koryak of Avacha River, Kor Kar = islanders of Karaginsk); the quite extensive Koryak list in Radliński, op. cit., V, 1895, p. 149f., also separately (used here), abbreviated Radl Kor; a list of "English-Koryak Stems" appended to Waldemar Bogoras' Koryak Texts (= American Ethnological Society, Publications, Vol. V), p. 142f., abbreviated Bog Kor Texts; a card-file dictionary of some 10,000 items compiled from over 500 pp. of Kamchadal folk-tales in the Jochelson Mss. of the N.Y. Public Library (s. f.n. 3 and 5), abbreviated JK2 (references to particular tales and pages thereof: JK2.32: 7 = tale #32, p. 7), the ethnological materials in the same collection, abbreviated JK1, and finally a three-page list of kinship terms appended to JK1, abbreviated JK1x; all the Jochelson material is from West Kamchadal, mostly the Xajrjuzovo or southern sub-dialect, but partly from the Sedanka or northern sub-dialect, the latter being heavily Koryak-influenced.

[5] The first extensive texts in Kamchadal will soon be available in D. S. Worth, Kamchadal Texts Collected by W. Jochelson, s'Gravenhage, 1959.

inaccurate recordings or unusual and as yet unstudied consonant alternations (e.g., č - g - d in čixtumx, gixtumx, dixtum *sister* Radl II.10,15,22) may obscure genetic relations; it is also true that many terms were simply not recorded in certain areas or at all (Krašeninnikov, for example, did not record any terms for *grandparent*, *grandchild*). Nevertheless, these dialectal differences in an essential part of the vocabulary are so great that they require explanation. One possibility is that Proto-Kamchadal split up into dialects prior to the formation of the kinship system recorded here; another is that certain Kamchadal dialects underwent very strong influences from neighboring languages. The first of these hypotheses cannot be tested by any reliable means. The second is true as far as Koryak to the North is concerned, but Koryak infiltration of Kamchadal is a relatively recent process and in any case cannot explain all, or even a large part of the dialectal divergences; the only other language known to have bordered on Kamchadal, Kurilian Ainu, has had no demonstrable influence on South Kamchadal. It might be more rational to account for the relatively small number of convergences rather than to explain the overwhelmingly large number of divergences; this might be done by assuming that there never was a unified Proto-Kamchadal language and attributing common lexical and grammatical features to convergent development of the Balkanism type, perhaps complicated at a later stage by borrowings from Koryak.[6] In any case, this problem can only be raised here; any definitive or even likely solution must await publication of much broader lexical and grammatical comparisons than those to which the present paper pretends.

[6] The linguistic unity of the Koryak language has also recently been called into question by the Chukchee specialist P. Ja. Skorik, s. V. A. Avrorin, "Novye issledovanija po jazykam narodnotej severa", Izvestija Akad. Nauk. SSSR, Otdel. it. i jaz., XVI, 1957, No. 5, p. 471.

The following abbreviations are used frequently:[7] NE, NE Kam = Northeast Kamchadal, spoken until the early twentieth century along the Kamchatka River valley and earlier along the East Coast from Uka in the North to Avacha Bay; S, S Kam = South Kamchadal, spoken until circa 1900 on the southern tip of the peninsula and earlier along the Southeast and Southwest Coasts; W, W Kam = West Kamchadal, still spoken in eight villages of the central West Coast (southern Tighil Region, Koryak National District) by approximately 500 speakers in 1957 but dying out under strong Koryak and Russian influence; Uka = a dialect spoken in the eighteenth century and perhaps later on the Uka River, considered by Krašeninnikov to be Koryak but obviously closely related to NE Kam; i.f. = incorporated form, e.g., ŋimsxi-pec *daughter* (literally *female son*), the non-incorporated form with adjective ending -n being ŋimsxin pec. Where no other meaning is given after a Kamchadal form, its meaning is that of the subsection head-word. Where a root occurs only in one form, this form is given in the root column and not repeated after the colon, e.g., kutaxuška:S Kam only Kraš 444. Stress is given where known, usually in W Kam forms from JK2; more and less frequent stresses are indicated by acute and grave respectively. A word preceded by an asterisk does not occur in exactly that form but is derived from the forms following in parentheses, e.g., * samses (dative samsezenk, pl. samsezēn). A root in parentheses followed by a number, e.g. (samses 2) indicates that the same root has already been discussed in an earlier subsection. Russian borrowings have not been included in this paper, in spite of their relative frequence, e.g., W Kam babukacex *grandmother* < Russ babuka, zurin *brother-in-law* < Russ šurin, since they will be treated in a separate paper.[8] Kamchadal

[7] Cf. also f.n. 4.

[8] D. S. Worth, "Russian borrowings in Kamchadal", to appear in 1959.

diminutives and other derived forms are not cited unless necessary to establish a root. Vowel shifts in oblique cases are not noted (e.g., isx *father* has a dative esxanke, nenekec *child* a comitative knanakacom). In the transcription, which compromises among those used by the various sources, length is indicated by a colon (a:), laryngealization by ˉ (ā), the velar nasal (Eng. sing) by ŋ, palatalized l by ļ, in Radl 1. (but in JK1 l′ = "anterior palatal sound, surd" JK1.1 p. 98); the uvular corresponding to k is q, but these two phonemes are not always distinguished in the sources; in Kraš g = γ, ḡ = g; Erman's transcriptions are in German and Sauer's in English, so Erman tsch = Sauer ch = č, Erman sch = Sauer sh = š etc.; the transcription of Koryak words from Bog Kor Texts has been simplified somewhat. In general, the transcriptions in all our sources are far from satisfactory, but in the absence of a reliable phonemic analysis of Kamchadal it was thought best to leave them as they are.

1.1. FATHER.

ep, ip, ap : predominantly NE and S Kam, rare in W (frequent in Koryak). NE (redoubled) ipip Kraš 444, epep Radl II.20; S apač′ Kraš 444, apač Radl III.2; W Sedanka epc, epe JK2.32 < Koryak, cf. Uka ep Kraš 461, Kor Kar papa *ibid.*, appa Bog Kor Texts 145, pepa *grandfather* Radl Kor 53, ạppạ *idem* Bog Kor Texts 146; no connection with the isolated W Kam èpeč *girl* Radl IV.21.

isx : W Kam only; išx Kraš 444, is-ch Sauer App, isx, izk, izg Radl IV.30, 31, isx, pl. ísxen JK1, JK1x, JK2; in compounds isxekex, isxekex *father-in-law* Radl IV.30, isxekesx *stepfather* JK1x.

1.2. MOTHER.

ag(n) : NE Kam only; aga, agag Radl II.1; cf. an below and ngə *wife*.

an : NE Kam only; antuan Kraš 444; perhaps related to W ánļàn *mother-, daughter-, sister-in-law*; cf. ag(n) above.

a:l : S Kam only; aalgač′ Kraš 444, aaļmač Radl III.1; probably related to NE ileks *mother-in-law*, ilens *maternal aunt* Radl II.25 and to Koryak alla, ilja, elli *mother* Kraš 461, ịļ Bog Kor Texts 148, ellaatgelag *mother-in-law* Radl Kor 9.

nazč : S Kam only; naz-ch Sauer App; perhaps, if n = nasal l, nazc = lexsx, cf. below.

lexsx : W Kam only; laxsxa Kraš 444, lexsx, legsx, legsk Radl IV.50, lexsx JK2, laxsx′ JK1, laxsx, pl. laxsxen JK1x; lisx JK2.41:28 probably = lusx, tlusx *aunt*; in compounds lexsxekex, lexsxeks, lexsxeksx *mother-in-law* Radl IV.50; perhaps related to NE ileks *mother-in-law* Radl II.25.

xéŋ : W Kam only (Sedanka); xéŋc, xéŋe JK2.6, JK2.32; cf. anxen *mother-in-law* JK1x, S kènižax *woman* Radl III.9.

1.3. CHILD, BOY, SON.

pe, pa : common to all Kam dialects and Uka. In the meaning *son*: NE peeč′ Kraš 444, peč Radl II.64; S peač′ Kraš 444, paač Radl III. 14, pa-atsh Sauer App; W pača Kraš 444, peč ix|in *male child* Radl IV-63, peč, pl. pen JK1, JK1x, JK2, pez Erman NW; cf. Uki peeč′ Kraš 461. In the meaning *child*: NE paaxčuč, paakxejč Radl II.63, pèč, pl. pèd Radl II.64; S paazid pl. Radl III.14; W paazid pl. Radl IV.62, peč, pl. pen Radl IV.63, pen pl. of nenekec Radl IV.58, pec, pl. pen JK2. In the meaning *boy*: NE paačuč′ Kraš 444, pahaitschisch Erman NE; S peagačuč′ Kraš 444, paaxastas Radl III.14, pahatsh Sauer App; W panaxča Kraš 444, pempse Erman NW, pémacex, pḗmacex JK2. In the meaning *young man*: NE paačuč′ Kraš 444, paxajčuč Radl II.63, pečučič Radl II.64; S peaičič′ Kraš 444. In compounds NE čidepeč′ Kraš 444, čideinpeč, čidepeč Radl II.11, W ŋímsxi-peč (i.f.) JK1 *daughter*; W peks.x ximsxin *stepdaughter* (< peks.x *stepson*) Radl IV.64, tm.e|ka|x peč *daughter-in-law* Radl IV.78.

ńéńe : W Kam only; nenekeč, pl. pèn (cf. pe, pa above) Radl IV.58, ńéńekecex dimin., pl. ńéńekenc JK2. In meaning *boy* W ńenekič JK1. In the meaning *young man*

W nanača Kraš 444; cf. panaxča *boy* < pe, pa. Originally meant only *sibling*: cf. W ńińe, ńańa *sister* JK2 and Kor Kar ninixš *younger brother or sister* Kraš 461. Unclear is the relation to Koryak enine *elder*, e.g., eninecija, eninela *elder brother*, eninel′-čakyget *elder sister* Kraš 461.

uɭɭuɭa : W Kam only Radl IV.82; < il, ul *younger, smaller*, cf. NE iluɭin peč *younger son* Radl II.26, iluɭin čidepeč *younger daughter* II.25 etc.; perhaps related to W hoɭa *young man* JK2 and NE alol *grandson*, alolč *granddaughter* Radl II.2,3; cf. Koryak iɭa′nyǫ *youngest brother or sister* Bog Kor Texts 153.

périyan : W Kam once only; "ínecx yúrtecex périyancex (Xajrjuzovo kpacecom) kzúnɭqazuknen *in that yurta with her child she lived*" JK2.41:19; cf. pe, pa above.

1.4. DAUGHTER.

suging : S and W Kam; S sugyng Kraš 444, sooguing Sauer App, sugin Radl III.16; W šuuinga Kraš 444; later replaced by analytic compounds, cf. below.

ximsxin pec : W Kam only; ximsxin peč Radl IV.12, peč xim.sxin Radl IV.63. In compounds peks.x ximsxin *stepdaughter* Radl IV.64, komlon ximsxin *granddaughter* Radl IV.45, rosx komlon ximsxin *great granddaughter* Radl IV.66, mitx ximsxin *grandmother* (literally *grandparent-female*) Radl IV.55, luxs.x ximsxin *niece* Radl IV.52. Probably = ŋímsxi, cf. below.

ŋímsxi: W Kam only, apparently developed from or replaced ximsxin, cf. above; pec-ŋimsxin JK2, ŋímsxi-peč (i.f.) JK1, nimsxin pec JK1x. In other compounds ŋímsxi nénekič (i.f.) *girl* JK1, nimsxin silatumx *sister, female cousin* JK1x, nimsxin imtx *younger cousin for a woman ibid.*, nimsxin kamlancix *granddaughter* JK1x, ŋímsxi kómlon, ŋímsxi kómron (i.f.) *idem* JK2, nimsxcin (sic) rosxkamloncix *great granddaughter* JK1x, ŋimsxin-mitx *grandmother* JK2, nimsxin xetskneninan mitx *great grandmother* JK1x, ŋímsxi luxsx (i.f.) *niece* JK1. As a substantive ŋimsx JK2, nimšč Radl IV.59 *woman*.

čidepeč : NE Kam only; čidepeč′ Kraš 444, čideinpeč, čidepeč Radl II.11; cf. (u)xəč, čix *girl*, čid *woman*, pe, pa *child*.

newük : W Kam once only Erman NW; probably a Koryak borrowing in Sedanka, cf. Koryak nèvèk *daughter* Radl Kor 47.

1.5. BROTHER.

tyj : NE and W Kam; NE tyja Kraš 444, tyix (esp. *elder brother*) Radl II.84; W tyja Kraš 444.

tiɭx : NE Kam only Radl II.74; perhaps = kilx, cf. below.

kilx : NE Kam only; kylxtem *brother for a woman* Radl II.57; cf. tiɭx above, kils *younger brother* Radl II.26, kiɭtumx *blood relation* Radl II.42, giterusx kiɭtumx *male cousin* Radl II.23.

silatumx : W Kam only *brother for a man*; silatumx Radl IV.68, salátumx JK1, silatumxrian *brothers and cousins* JK1x, sílatumx *elder brother* JK2, silatumx, pl. silatumxin *elder brother, cousin* JK1x; sila is related to but not = sala *younger*, cf. šaɭan kitkinym *younger brother* Radl IV.69, salan silatumx, salan imtx *idem* JK1x; tumx = *sibling*, cf. NE čixtumx, gixtumx *sister* Radl II.10,22; W sílatumx, Sedanka zlatumx *elder sister* JK2.

qĭtkin : W Kam only *brother for a woman*; kitkinym Radl IV. 42, qĭtkinin, -en JK2, xaitkinen, pl. xaitkinin JK1x; cf. Koryak kajtakalgon Radl Kor 31.

kutaxuška : S Kam only Kraš 444; perhaps = k-tshidzshi Sauer App, but cf. kyscyš *elder brother* below; cf. kutxa:n *sister* below.

1.6. BROTHER, ELDER.

kyscyš : NE Kam only Radl II.57; cf. k-tshidzshi *brother* Sauer App.

(silatumx 2) : W Kam only JK1x, JK2; cf. *brother* above; in compounds tl′xoncan silatumx (also *elder cousin*) JK1x.

(qĭtkin 2) : W Kam only in compound tl′xoncan xaitkinen *elder brother or male cousin for a woman* JK1x.

1.7. BROTHER, YOUNGER.

kils : NE Kam only, in compounds; uluɭin kils Radl II.26; cf. kylxtem *brother*

Radl II.57, kuʃsxit *father-in-law* Radl II.54; = (?) kins, cf. below.

kins : S Kam only Radl III.10; = (?) kils, cf. above.

ímtx : W Kam only *y.b. for a man* JK2; in compounds salan imtx JK1x; perhaps related to mitx *grandfather*.

(silatumx 3) : W Kam only, in compounds; šaʃan silatumx *y.b. for a man* Radl IV.69, salan silatumx JK1x.

(qītkin 3) : W Kam only, in compounds; šaʃan kitkinym *y.b. for a woman* Radl IV.69.

1.8. SISTER.

čixtum : NE Kam only; ixtum Kraš 444, čixtumx, gixtumx, dixtum Radl II.10,15,22; <čix *girl*, cf. (u)xəč, čix *girl*, čixenguč′ *wife* Kraš 444, + tumx *sibling*, cf. silatumx above.

kunsxux : NE Kam only *sister for a man* Radl II.15,55.

kutxa:n : S Kam only Kraš 444; cf. kutaxuška *brother ibid*.

kosču : S Kam only; kos-choo Sauer App; cf. NE kyscyš *elder brother* Radl II.57.

líʃix] : W Kam only; lilixlč′ Kraš 444, lylyxl Radl IV.52, líʃix] JK2, lilixs JK1, lilixl′, pl. lilixlin *wife's sister* JK1x.

1.9. SISTER, ELDER.

(sílatumx 4) : W Kam only; Sedanka zlatumx JK2; cf. *brother*.

(líʃix] 2) : W Kam only, in compounds; ktxáncen líʃixs JK1, tl′xoncan lilixl′ JK1x.

1.10. SISTER, YOUNGER.

(ímtx 2) : W Kam only JK2; cf. *younger brother*.

(čixtum 2) : NE Kam only, in compounds; iluʃin gixtumx Radl II.26.

(lilix] 3) : W Kam only, in compounds; šaʃan lylyxl Radl IV.69.

(sílatumx 5) : W Kam only, in compounds; salan nimsxin silatumx, lit. *younger female sibling* JK1x.

2.1. GRANDFATHER.

ak : NE Kam only; akak, akoak (redoubled), akxr, akrx Radl II.2; originally *grandparent*, cf. akxra, akrxon *grandmother ibid*.

mitx : S and W Kam; S mitx Radl III.12; W mitx, mitg, mitk, mits, mytx Radl IV.55, 56, mítx JK2, métx *grandparent* JK1, mitx, pl. mitxen JK1x; originally *grandparent*, cf. mitx ximsxin etc. *grandmother*; perhaps related to imtx *younger brother*.

2.2. GRANDFATHER, GREAT.

(Compounds only; W Kam xetskneninan mitx JK1x).

2.3. GRANDMOTHER.

(ak 2) : NE Kam only; akxra, akrxon Radl II.2; cf. *grandfather*.

(mitx 2) : S and W Kam, usually in compounds; S ximsxin mytx Radl III.12, W mitx ximsxin, mitx txlon (*grandparent old woman*) Radl IV.55, mitx, ŋímsxin-mitx JK2, metx *grandparent* JK1; cf. *grandfather*.

mecxotʃ : W Kam JK2.41:28 only.

2.4. GRANDMOTHER, GREAT.

(Compounds only; W Kam nimsxin xetskneninan mitx JK1x).

2.5. GRANDSON.

alol : NE Kam only Radl II.2; cf. alolč *granddaughter*.

kəmlo : NE and W Kam; NE kymlot Radl II.57; W komlon Radl IV.45, kámlon *grandchild* JK2, komlon, komron JK1; in compounds ixl′cin kamlancix lit. *male little grandchild* JK1x.

2.6. GRANDSON, GREAT.

(Compounds only; W Kam rosx komlon Radl IV.66, rosxkamloň JK1x, ixl′cin-roskamloncix JK1x; cf. nimsxin rosxkamloncix *great granddaughter ibid*.).

2.7. GRANDDAUGHTER.

(alol 2) : Ne Kam only; alolč Radl II.3; < alol *grandchild* + č(i) (?) *girl*, cf. (u)xəč, čix *girl*.

(Compounds: W Kam komlon ximsxin Radl IV.45, ŋímsxi kómlon (i.f.), ŋímsxi kómron (i.f.) JK1, nimsxin kamlancix JK1x; cf. kəmlo *grandson*).

2.8. GRANDDAUGHTER, GREAT.

(Compounds only; W Kam rosx komlon ximsxin Radl IV.66, nimsxcin rosxkamloncix JK1x; cf. *great grandson*).

3.1. UNCLE.

costanom : NE Kam only; costanom *paternal uncle* Radl II.9, čoschtanom *maternal u.* Radl II.12.

kivs : S and W Kam; S kius *paternal uncle* Radl III.10; W kius, kiv.sx *maternal or paternal u.* Radl IV.42, kíxus JK1, kifsx, pl. kifsxen (also *parents' male cousins*) JK1x; in compounds tmalkenan kifsx *aunt's husband for man and woman ibid.*

3.2. AUNT.

ile : NE Kam only; ilens *mother's sister* Radl II.25, pilemč *father's sister* Radl II.64; related to ileks *mother-in-law* Radl II.25.

a:d : S Kam only; aad Radl III.1; cf. a:l *mother.*

tlusx : W Kam only; lisx Radl IV.51, lusx, tlésux′ JK2, tluɛx, pl. tlusxun (also *mother's or father's female cousins*) JK1x; in compounds tmalkenan tlusx *uncle's wife* JK1x.[9]

3.3. NEPHEW.

kidəx : NE Kam only; kidx Radl II.39, kudex *sister's son* Radl II.53; related to kislx *niece*, cf. below.

luxsx : W Kam only; luxs.x *sister's son* Radl IV.52, luxsx′ JK1, luxsx, pl. luxsxin JK1x; cf. *niece* below.

3.4. NIECE.

kislx : NE Kam only; kislx, kyslx Radl II.46,57; related to kidəx *nephew*, cf. above.

(Compounds: W Kam luxs.x ximsxin *sister's daughter* Radl IV.52, ŋímsxi luxsx [i.f.] JK1; cf. luxsx *nephew* above).

3.5. COUSIN.

kuslim : NE Kam only *male cousin, mother's side* Radl II.56.

eceza : NE Kam only *female c., mother's side* Radl II.19; cf. Uka ečič′ *elder sister* Kraš 461, Koryak ešegi šakgeš *younger sister* Radl Kor 14.

inpun : W Kam only *male or female c., mother's side*; inpun]x, inpun]g Radl IV.28 (also *wife's brother, ibid.*); = inpun *daughter-in-law*, inpul′x, pl. inpulan *sister-in-law for man or woman, husband's brother, sister's husband for woman* JK1x; cf. NE kispunx] *daughter- or sister-in-law* Radl II.46.

(silatumx 5) : W Kam only; silatumx, pl. silatumxin *elder brother or cousin for a man*, silatumxrian *brothers and male cousins*, nimsxin silatumx *sister or female cousin for a woman*, tl′xoncan nimsxin silatumx *elder sister or female cousin* JK1x.

(qītkin 4) : W Kam only; xaitkinen, pl. xaitkinin *brother or male cousin for a woman* JK1x.

(lilix] 4) : W Kam only; lilixl′, pl. lilixlin *sister or female cousin for a man*, tl′xoncan lilixl′ *elder female cousin for a man*, salan lilixl′ *younger female cousin for a man* JK1x; cf. lilix] *sister.*

4.1. HUSBAND.

ken(g/k) : NE Kam only; kengiš Kraš 444, kenesx Radl II.37, kenks Radl II.38; cf. Uka kengil′ Kraš 461.

krošč : NE Kam only; kroschtscha Erman NE; = krošč *man*, cf. below.

ilx : S Kam only; elku Kraš 444, i]x Radl III.5.

skoč : S Kam only; skoch Sauer App; cf. squa-aw *wife ibid.*

qámzan : W Kam only; kamžan Kraš 444, kamzan Radl IV.34, qámzan JK2; probably related to S and W Kam uškamža *man* Kraš 444 and surely to W Kam čamza, qcámza *man.*

4.2. WIFE.

ngə : common to all Kam dialects and Uka; NE čixenguč′ Kraš 444 (cf. *girl*), čixeguč Radl II.10, čyxemič Radl II.13, tschihench Erman NE; S ngyngyč′ (redoubled) Kraš 444, i]ga, i]gax (probably nasal l ~ n) Radl III.6; W igyč′ Kraš 444, nanyč, nnyč Radl IV.57, 59, ŋic (ng > ŋ) JK2; Uka dingyč′ Kraš 461; related to Koryak neg, nev, ñaw *woman, wife* etc., cf. Kor Nom, Sed neguen *wife* Kraš 461, Kor Kar nyfnyxš (redoubled) *ibid.*, nevan Radl Kor 47, ñáwan Bog Kor Texts 153; also Kor Nom, Sed nḡavakyk *daughter* Kraš 461 < ngav + akyk *son, child.*

[9] Jochelson, JK1x:iii notes the saying *tmalkenan tlusx qam inmesinkex* "an aunt related not by blood does not hinder (nuptial ties)", i.e. her blood relations are not counted as relatives.

cürk : NE Kam only; tschürk Erman NE.

squa:w : S Kam only; squa-aw Sauer App; an interesting coincidence of unexplained origin.

wims : W Kam only Erman NW; perhaps = ŋimsx *woman*.

4.3. FATHER-IN-LAW.

ku]sxit : NE Kam only Radl II.54.

samses : W Kam only; šamšaz Radl IV.70, samses, pl. samsesen JK1x; originally *male in-law*, cf. *son-in-law*, *brother-in-law*.

isxekə(s)x : W Kam only; isxekex, isxekx Radl IV.30, isxekesx JK1x (also *stepfather*); < isx *father* + kə(s)x *in-law*, cf. lexsxkə(s)x *mother-in-law*, peks.x *stepson*; isx *father* also used for *father-in-law* JK1x.

(Compounds: NE Kam lava epein, lova epein Radl II.58,60; < lova *relation by marriage* (?), cf. Koryak navllv.e *niece* Radl Kor 45, allave *nephew ibid.* 4, Kor Nom lovela *young man* Kraš 461 + ep *father*.

4.4. MOTHER-IN-LAW.

ileks : NE Kam only Radl II.25; related to ilens *aunt ibid.*, -ks perhaps = -kə(s)x *in-law*, cf. isxekə(s)x *father-in-law*.

kosmixč : NE Kam only *husband's mother* Radl II.51.

ánļàn : W Kam only; ańļan, ańļšan Radl IV.5, ánlàn, énļan JK2, anxen *husband's or wife's mother* JK1x; cf. *sister-in-law*, *daughter-in-law*.

lexsxekə(s)x : W Kam only; lexsxekex, lexsxeks, lexsxeksx Radl IV.50; < lexsx *mother* + kə(s)x *in-law*, cf. isxekə(s)x *father-in-law*.

4.5. SON-IN-LAW.

ponxstaz : NE Kam only Radl II.65; probably = pons]taz *brother-in-law ibid.*

(samses 2) : W Kam only; šamšaz Radl IV.70, sámses (also *husband of wife's sister*) JK1, samses, pl. samsesen JK1x; cf. *father-in-law*, *brother-in-law*.

4.6. DAUGHTER-IN-LAW.

kispunx] : NE Kam only Radl II.46 (also *sister-in-law*); cf. inpun]x *cousin*.

kym]x : NE Kam only Radl II.57; cf. kəmlo *grandson*.

spuxt : S Kam only Radl III.16; pl. nimutkut′.

nimutkut′ : S Kam only Radl III.16; pl of spuxt.

(ánļàn 2) : W Kam only; ańļan, ańļšan Radl IV.28; cf. *mother-in-law*, *sister-in-law*.

(inpun 2) : W Kam only; inpun Radl IV.28; = inpun]x *cousin*.

(Compound: W Kam tm.e]ka]x peč Radl IV.78).

4.7. BROTHER-IN-LAW.

piļilum : NE Kam only Radl II.64.

·pons]taz : NE Kam only Radl II.65; probably = ponxstaz *son-in-law ibid.*

(samses 3) : W Kam only; šamšaz Radl IV.70, * sámses (dative sámsezenk, pl. sámsezēn) JK2, samses, pl. samsesen JK1x; cf. *father-in-law*, *son-in-law*.

(inpun 3) : W Kam only; inpun]x, inpun]g Radl IV.28, inpul′x, pl. inpulan *sister's husband for a woman*, *brother's wife*, *husband's brother* JK1x; cf. *cousin*.

4.8. SISTER-IN-LAW.

səx(k) : common to all Kam dialects; NE exsxoa Radl II.19; S kaasx Radl III.7, kos-choo *sister* Sauer App, cf. squa-aw *wife ibid.*; W sxuan Radl IV.67, f.sknan, f.skvnan Radl IV.23, suxkúŋ *husband's sister* JK2, suxkunan *idem* JK1x; may < xsəx(k).

(kispunx] 2) : NE Kam only Radl II.46; cf. *daughter-in-law*.

(lilix] 5) : W Kam only; lilixl′, pl. lilixlin *wife's sister* JK1x; cf. *sister*, *cousin*.

(ánļàn 3) : W Kam only; ańļan, ańļšan Radl IV.5; cf. *mother-in-law*, *daughter-in-law*.

(inpun 4) : W Kam only; inpul′x, pl. inpulan *brother's wife* JK1x; cf. *brother-in-law*.

5.1. MAN.

uškamža : S and W Kam; S uškamža Kraš 444, uskaams Sauer App, vuškamžax, pl. nakaz, cf. below Radl III.14,20; W uškamža Kraš 444; probably related to qámzan *husband* and čamza below.

čamza : W Kam only; čamza]an *men*, sing. čamza]č čamza]g, camzan]g Radl IV.14,15, qcámzan(]) JK2, ksámsan Erman

NW; cf. uškamža above, W Kam qámzan *husband*, and Kor Kar ošamčagal *man* Kraš 461, the latter or a similar form being the origin of Russian Kamčadaly, Engl. Kamchadal.

(krošč 2) : NE Kam only; kroščuga Kraš 444, kroščox Radl II.53, kroščoran *human ibid.*; cf. kroščosčič *young man* Radl II.53, kroschtscha *husband* Erman NE.

nak : NE and S Kam, plural only; NE nakiɭd *men, people* Radl II.62; S nakaz pl. of vuškamžax *man* Radl III.14,20; cf. Uka nakamxač *young man* Kraš 461.

wskanxɭ : W Kam only; term used only by animals in folk tales JK2; perhaps related to ken(g/k) *husband*.

5.2. MAN, OLD.

xalkčuč : NE Kam only; chalktschutsch Erman NE.

vèkačič : S Kam only Radl III.19; perhaps related to xéqa below.

xéqa : W Kam only; xéqa, xe̋qas, qéqa, dim. pl. xeqānc JK2.

šikač : W Kam only Radl IV.71.

5.3. MAN, YOUNG.

(pe, pa 2) : NE and S Kam; NE paačuč′ Kraš 444, paxajčuč, pečučič Radl II.63,64; S peaičič Kraš 444; cf. pe, pa *child*.

(ńéńe 2) : W Kam only; nanača Kraš 444; cf. ńéńe *child*.

(krošč 3) : NE Kam only; kroščisčič Radl II.53; cf. krošč *husband, man*.

hoɭa : W Kam only; hoɭa, pl. hoɭāɲ JK2; cf. uɭɭuɭa *child*.

5.4. WOMAN.

čid : NE Kam only; čyduxeɭka Radl II.19, čid, čideč, pl. čided Radl II.10, cydx Radl II.13; in compound čidepeč *daughter* (lit. *female son*); cf. (u)xəč, čix *girl*.

(ŋimsx 2) : W Kam only; nimšč Radl II.59, ŋímsx JK2; cf. ŋímsxi *daughter*.

kènižax : S Kam only Radl III.9; perhaps related to ken(g/k) *husband*.

5.5. WOMAN, OLD.

kračič : NE Kam only; kračič, kroačič Radl II.52,53; pratschitsch Erman NE.

ka:txačič : S Kam only; kaatxačič Radl III.7.

txlo : W Kam only; txlo, txlōn Radl IV.75, * txlo (dimin. txlocex, -cx; pl. txlōnc) JK2; in compound mitx txlon *grandmother* (lit. *grandparent old woman*) Radl IV.55.

5.6. WOMAN, YOUNG.

(u)xəč, čix : common to all Kam dialects and Uka; NE čixuačuč′ Kraš 444, uxčič, pl. uxčid Radl II.84, uchtschitsch Erman NE; S xučiču Kraš 444, čikčič Radl III.3, ch-tshitshoo Sauer App; W uxčumaxča (redoubled) Kraš 444; cf. Uka uxčimkač′ Kraš 461 and uxčipeeč′ *daughter ibid.*, čixenguč′ *wife*, čixtumx *sister*, čidepeč *daughter*.

eke : W Kam only; èk.enč Radl IV.19, ékenc pl. JK2, ekoz Erman NW; related to Koryak ak, ek *son, child*, e.g. Kor Nom, Sed akyk *son* Kraš 461, Kor Kar ikiku *ibid.*; probably = the second element of W Kam newük *daughter* Erman NW, of which the first element < ngə, Koryak nev, ñaw *wife, female*, cf. nèvèk *daughter* Radl Kor 47, ñaw *woman* etc. Bog Kor Texts 146.

laŋe : W Kam only frequent in JK2; perhaps related to Koryak ɭageg *girl* Radl Kor 37.

èpeč : W Kam Radl IV.21 only; origin unclear.

6.1. STEPFATHER.

(isxekə(s)x 2) : W Kam only; isxekesx JK1x; cf. *father-in-law*.

6.2. STEPSON.

peks.x : W Kam only Radl IV.64; < pe *child* + kə(s)x *in-law*; cf. isxekə(s)x *father-in-law, stepfather*, lexsxekə(s)x *mother-in-law*.

6.3. STEPDAUGHTER.

(Compounds: W Kam peks.x ximsxin Radl IV.64).

6.4. PARENTS, FOREFATHERS.

ximitxen : W Kam only JK1x; < xi (?) + mitx *grandparent*; in compound xetskneninan ximitx *forefathers* JK1x.

6.5. RELATIVE.

kiɭtumx : NE Kam only Radl II.42; cf. kils *brother* Radl II.26.

tinútin (?) : W Kam only JK2.33:10 *some female relative*.

CONSONANT HARMONY IN WIYOT (WITH A NOTE ON CREE)

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1. Introduction
2. Wiyot consonant symbolism
3. Wiyot consonant harmony
4. Consonant harmony in Cree

1. The process I call consonant harmony[1a] occurs on the North American continent in at least three separate languages, as different as Wishram (Chinook)[1b] on the Washington-Oregon border, Navaho[2] in the Southwest, and Wiyot in northwestern California. This paper describes the functioning of the process in the last-named of these languages.[3]

2. Wiyot is characterized by an alternation of consonants which has both a morphological and a morphophonemic aspect. The morphological aspect, discussed in this section, is a diminutive-augmentative consonant symbolism.[4] In this process consonants[5] are related as follows:

	Dim.	c	š	r
'	Normal	t	s	l
	Aug.	č	š	r

The specific diminutive and augmentative morphemes are -o·c and -ačk, respectively. These are suffixed to noun or verb stems, and any stem consonants among those listed above change accordingly. Examples:

(1) lóliswił *he sings* (-ił third person subject suffix); rórišwo·cił *he hums.*

(2) tawí·paʔlił *rope*; cawí·paʔroło·c[6] *twine*; čawí·paʔrołačk *heavy cable.* Replacement of /i/ by /o/ in the latter two forms is irregular.

(3) laptóʔw *cloud*; lapcóʔyawo·c *little cloud*; lapčóʔyawačk *big cloud, storm cloud.* See fn. 6 for retention of initial /l/. Insertion of -ya in the derived forms is the result

[1a] Otto Jespersen (Language, 1922, p. 280) uses the term "consonant-harmonization" to refer to a similar phenomenon.

[1b] Wishram consonant harmony is combined with a diminutive-augmentative consonant symbolism, as is the case in Wiyot (sections **2** and **3**); "there is a distinct tendency to have all the consonants of a word bear a consistent diminutive or augmentative coloring." Edward Sapir, Diminutive and Augmentative Consonantism in Wishram, *in* Boas, Handbook of American Indian Languages, BAE-B 40, 1911, pp. 638–645.

[2] In Navaho consonant harmony is purely morphophonemic: the phonemes of the two sets /s z ʒ c ć/ and /š ž j č ǰ/ are mutually exclusive within word boundaries. Consonants occurring latest in the word control assimilation of preceding consonants to the corresponding ones of the proper set. Harry Hoijer, Navaho Phonology, Univ. of N. Mex. Pubs. in Anth. 1, Albuquerque, 1945, pp. 11–14.

[3] The data on which this description is based was recorded by the writer on field trips in 1956 and 1957, under the sponsorship of the Survey of California Indian Languages, Department of Linguistics, University of California, Berkeley. The only previous extensive work on Wiyot is Gladys A. Reichard, Wiyot Grammar and Texts, UCPAAE 22.1–215. My own material on the phase of Wiyot here in question is more complete, and thus I have preferred its use for present purposes.

[4] This and other types of 'consonantal play,' truly, as Sapir wrote in 1915, are "a fruitful field for investigation in American linguistics and should receive more attention." Edward Sapir, Abnormal Types of Speech in Nootka, Canada Dept. of Mines, Geol. Survey, Mem. 62, Anth. Series no. 5, 1915, 21 pp. Reprinted in Selected Writings of Edward Sapir, 1951, pp. 179–196. The quoted passage is on p. 186.

[5] Wiyot consonants are /p t c č k kw b d z ž g ʔ β s ł š γ h m n w y l ɾ r/ (the first six are fortis unaspirated, the second five lenis aspirated, stops and affricates; ɾ is a flap and r a trill). Other phonemes include vowels /i e a o u/ and two accents, symbolized by ´ ˜, which combine features of pitch and stress.

[6] It should be noted that the corpus also exemplifies this word with the initial consonant unchanged. Among several kinds of cases where consonants do not change according to the general rule, this type is the commonest.

of a regular morphophonemic process not relevant to our present concern.

(4) ɽóʔl *large plate basket sp.*; ɽóʔrачk *used* or *old plate basket.*

The common meaning of the diminutive is littleness; rarely it indicates affection. The augmentative may refer to bigness, but more often it is simply pejorative. This latter meaning is especially frequent with words for people, personified animals, and household utensils.

3. The process in Wiyot which I have named consonant harmony affects the same consonants as those involved in diminutive-augmentative consonantism, but without change in meaning. It most frequently occurs when a stem contains a 'diminutive' or 'augmentative' consonant. In this case affixes which include in their commonest forms any of the phonemes /t s l/ show these changed to forms which harmonize. Contrast the following two examples:

(5) ɽoʔtatwówi·lił *he admires me* (root ɽoʔtatw-, stem formative -o, first person object suffix -wi·l, third person subject suffix -ił).

(6) tiškówi·rił *he likes me* (stem tiškó-, same suffixes). See fn. 6 for retention of initial /t/.

A few stems which do not themselves contain any changed consonants nevertheless regularly take the changed form of suffixes, e.g.:

(7) walósił *he sees you* (stem waló-second person object suffix -s, suffix -ił).

(8) tukłóšił *he looks at you* (stem tukłó-, same suffixes). In respect of this type of alternation, Wiyot consonant harmony is not purely synchronic.

The basic feature of consonant harmony in Wiyot, then, is a tendency for consonants to assimilate in certain patterns within the word, or conversely, for certain groups of consonants to be mutually exclusive within the word. There is a three-way opposition among the consonants t : c : č; a two-way contrast obtains between s : š and between l : r.

4. As a sort of appendix to this paper, we note a specific problem in Algonquian on which Wiyot may throw some light, especially now that the question of the relationship of the Algonquian languages to Wiyot (and geographically contiguous Yurok) has been definitively settled by the evidence presented by Haas in a recent paper.[7]

An article in this journal by Hockett[8] traces the development of /t/ and /c/ since PCA times, and by a distributional survey of these phonemes in PCA and several of the modern Central Algonquian languages shows convincingly that the contrast between them in PCA times was only across word boundaries, when final vowels were lost in sandhi. Otherwise they were in complementary distribution: c before i i· y, t elsewhere. But a problem arises in Cree, and this is what concerns us here. In this language there is an alternation between /t/ and /c/ as follows:

"... in the formation of diminutives an ending containing /s/ is added to the underlying stem; in addition, most speakers replace a /t/ anywhere earlier in the word by /c/. This habit is carried over also to some non-diminutive forms with an /s/ near the end of the word."[9]

A partial statement of the situation in Wiyot may be made in parallel form:

[7] Mary R. Haas, Algonkian and Ritwan: The End of a Controversy, IJAL 24.159–173 (1958). A striking morphophonemic resemblance between PCA and Wiyot may be added to Haas' evidence: in PCA when possessive prefixes are used with a stem beginning in a vowel, *t is inserted between the prefix and stem. In Wiyot, stems in hV- (PCA *V- : W hV- regularly), hV- > -tV- after possessive prefixes. Examples: PCA *ehkw- *louse*, *netehkw- *my louse*; Wiyot híkw *louse*, ɽutíkw *my louse.*

[8] Charles F. Hockett, Central Algonquian /t/ and /c/, IJAL 22.202–207 (1956).

[9] Hockett, op. cit., p. 204.

In the formation of diminutives an ending containing /c/ is added to the underlying stem; in addition, a /t/ anywhere earlier in the word is normally replaced by /c/. This habit is carried over also to nondiminutive forms with a /c/ anywhere in the word.

Are these phenomena cognate? Their similarity seems too detailed to explain by coincidence. If they are indeed cognate, the history of *t and *c may be pushed back further. Hockett's data points to an allophonic relationship between them in Pre-PCA, so he must take the Cree alternation as 'apparently recent.' Now perhaps we can ascribe to the prototype of both Wiyot and Algonquian the operation of t-c alternation in consonant harmony and in diminutives, much as in Cree and Wiyot today. When some of the daughter languages lost this consonant harmony the distinction was leveled, and phonemic merger took place; or perhaps this stage was never quite reached. Then we may pick up Hockett's account: t and c were again thrown into contrast by external sandhi, and so on. The alternation in Cree is then archaic, not recent.

THE PHONEMES OF CHONTAL (MAYAN)

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0. Introduction
1. Vowel inventory
2. Consonant inventory
3. Distribution of vowels and consonants
4. Spanish loans
5. Stress
6. Length features

0. This paper[1] presents the phonemic system of Mayan Chontal as spoken in the town of Tapotzingo, Tabasco, Mexico. The Indians of this town have been in contact with Spanish, and as a result they represent varying degrees of bilingualism. Some, especially women, know very little (if any) Spanish. With a few exceptions, Chontal is spoken in the homes and is the first language of the children. The village school is conducted in Spanish, and school age children are exposed to Spanish, and are taught to read and write Spanish. Government officials and vendors visit the town, providing another local contact with Spanish. Many of the men make trips to Spanish-speaking centers to sell their wares, or spend several weeks at a time working on plantations for Spanish-speaking employers. Terms for things foreign to the old Chontal culture are continually being borrowed. It is difficult to draw a line between 'Chontal' and 'Spanish', and to say which of the borrowings are fully assimilated and which are not.[2] It is the purpose of this paper to present the basic phonological structure of Chontal, but at the same time to point out briefly the general direction of the influence of Spanish on the language.

The data upon which this paper is based were gathered from various informants over a period of several years. Although two main informants were used, the speech of others in the town has been observed and recorded. Thus, the resulting statement is not that of one speaker's idiolect, but rather is intended to represent the language of a particular community.[3]

1. The six vowel phonemes are i, ə, u, e, a, o. The vowels i, ə, and u contrast with the vowels e, a, and o respectively in tongue height. The i and e are front close unrounded, and the u and o are back close rounded. The ə and a are unrounded, with the a being low central. The ə is somewhat lower than the other high vowels and slightly farther front than u; it is therefore also classed as central.

Examples of the tongue height contrasts are: i and e: c'in *yucca*, c'en *bed*; ə and a:

[1] The data were gathered in a series of field trips under the auspices of the Summer Institute of Linguistics.

I am indebted to C. F. Voegelin, H. V. Velten, and Sol Saporta, who read an earlier draft of this paper and made helpful comments. Also I have profited from discussions with colleagues of the Summer Institute of Linguistics, especially Ben Elson and Eunice Pike who listened to some of the material on tapes.

For a treatment of consonant clusters in Chontal see Kathryn C. Keller and Sol Saporta, The Frequency of Consonant Clusters in Chontal, IJAL 23.28–35 (1957).

[2] The question of the point at which words from one language become a part of another language is an interesting one. For further discussion see Charles C. Fries and Kenneth L. Pike, Coexistent Phonemic Systems, Lg. 25.29–50 (1949); William L. Wonderly, Phonemic Acculturation in Zoque, IJAL 12.92–5 (1946); Raymond Larsen and Eunice Pike, Huasteco Intonations and Phonemes, Lg. 25.268–77 (1949); Douglas Taylor, Phonemes of the Hopkins (British Honduras) Dialect of Island Carib, IJAL 21.233–41 (1955).

[3] See George L. Trager and Henry Lee Smith, Jr., An Outline of English Structure, Studies in Linguistics: Occasional Papers, No. 3 (1951).

k'əb *hand*, k'ab *gravy*; u and o: tuh *it stinks*, toh *it is true*.

Examples of contrasts in fronting, or fronting combined with tongue height are: i, ə, u, e: k'in *sun*, k'ən *yellow*, k'un *rotten*, k'en *many*; e, a, o, i, ə: teʔ *tree*, taʔ *excrement*, toʔ *kind of leaf (similar to the banana leaf)*, tiʔ *mouth*, təʔ *very*; i, a, o: pim *thick*, pam *head*, pom *incense*; ə, o: č'ək *flea*, č'ok *child*; e, u, a: čen *make it*, čun *it is short*, čan *snake*.

Vowels contiguous to glottalized consonants, glottal stop, or the allophone of the phoneme b which has glottal quality (see **2** below) may be laryngealized. The laryngealization is more pronounced between two such consonants than when contiguous to just one: ʔu k'əʔnán· [ʔṵ k'ə̰ʔnán][4] *it gets ripe*, ʔit'obní [ʔḭt'o̰bní] *darkness*, ʔahkənc'íb *he who is learning to write*, ʔahpək'ób *a planter*, ʔu c'aʔí *it left its mark on it*, ʔu tuntek'éʔ *he kicks it with his heel*.

Unstressed vowels vary noncontrastively from voiced to voiceless when the vowel is preceded by the sibilant or sibilant released phonemes s, č, č', c' and followed by p, t, k, h. This variation also occurs in the morphemes ʔah- and ʔiš- when these morphemes occur utterance initial: ʔahwarúč' [ʔahwarúč'] or [ʔAhwarúč'] *a kind of tree*, ʔiščúč [ʔiščúč] or [Iščúč] *squirrel*, čitám [čitám] or [čItám] *pig*, č'upím [č'upím] or [č'Upím] *old (in age)*, səkc'ít [səkc'ít] or [səkc'ít] *Tucta* (the name of a town), čikčikné (čikčikné] or [čIkčIkné] *shivering*, ʔahčəkčitám [ʔahčəkčitám] or [ʔahčəkčItám] *a kind of pig*, c'əktesán [c'əktesán] or (c'ə̰ktesán] *to fill up or complete to full measure*, č'uhteʔ [č'uhteʔ] or [č'Uhteʔ] *cedar tree*, čiktán [čiktán] or [čIktán] *shine*.

Utterance final vowels may be followed by slight aspiration of the same quality as the vowel: wəyé [wəyéE] *sleep*, wek'wek'ná [wek'wek'náA] *it is in motion* (liquids). This aspiration is much lighter than that which is interpreted as final phonemic h.

2. The consonant phonemes are stops p, t, k, p', t', k', b, d, g, ʔ; affricates c, č, c', č'; spirants (f), s, š, h, w, y; nasals m, n; liquids l, r, (r̄).

The stops p, t, k contrast at bilabial, dental, and velar points of articulation: pək'ó *plant it*, tək'ó *start it*, kək'í *I gave it*. The velar stop is influenced in its tongue position by vowels which occur in the same syllable with it; it is farther front before front vowels or when it closes a syllable containing a front vowel than it is before back vowels or when it closes a syllable containing a back vowel. These stops are heavily aspirated before pause: lup [lupʰ] *flood*, mut [mutʰ] *bird*, c'ak [c'akʰ] *medicine*. Before vowels, the aspiration in general is slight, but tends to be heavier in emphasized syllables. Also, the amount of aspiration varies somewhat with different speakers. Of my chief informants, the woman who had comparatively little contact with Spanish and does not speak Spanish had heavier aspiration than the two bilingual men. Light aspiration occurs when p, t, or k are followed by a consonant: ʔahcepté? [ʔahcepʰté?] *he who cuts down trees*, čəpkí [čəpʰkí] *it was cooked*, waləktán [waləkʰtán] *abandon it*, mopk'ób [mopʰk'ób] *finger ring*, sutwəní [sutʰwəní] *he returned*, ʔahpətp'ét [ʔahpətʰp'étʰ] *he who forms clay pots*. When, however, t is followed by c, č, or n this aspiration is usually absent, and it may be absent when p is followed by p or b. The aspiration is usually voiced (actualizing as a weak central vocoid) when a voiced consonant follows p or k: həc'əkná [həc'əkᵊná][5] *it is tasty*, pəkyəlí [pəkᵊyəlí] *it fell face down*, buklá [bukᵊlá] *clouds*. (The phoneme ə is longer and more prominent than the transi-

[4] Throughout the paper, when a phonetic rendering of an illustration is given in brackets, phonemic symbols are used except for the particular item under attention at the moment, so as not to burden the reader with nonpertinent subphonemic detail.

[5] When the informant gives this word syllable by syllable, so that pause occurs after the k, the aspiration is the type which occurs before pause (voiceless and heavy) rather than voiced: [hə c'əkʰ na].

tional vocoid: kə ná? *my mother*, ?u kəné? *he is learning*, č'okəyesán *cause it to melt*, c'əkəlkí *he was medicined*.)

The stops p', t', and k' are glottalized, and contrast at bilabial, dental, and velar points of articulation: p'elé *sliced*, t'elé *slanting*, k'ehpán *scold*. Examples of their contrast with the aspirated stops are: pos *pale*, p'os *sweepings*, tub *spittle*, t'ub *gourd*, kuš *go*, k'uš *it hurts*.

The stops b, d, g are voiced before vowels. They contrast at bilabial, dental, and velar points of articulation: badá *now*, ganá *gain*. They contrast with the voiceless stops: pálən *trim it*, p'álən *reply*, báləɑ *wind it*, túpən *roll it up*, túbən *spit on it*, p'et *clay pot*, bet *debt*; tan *lime*, t'an *word*, dáli *later today*, t'álək *loose weave*; kak' *my tongue*, k'ak' *fire*, gas *kerosene*, ?ankrén *run*, ?iščingolín *a kind of bird*.

The phoneme b when occurring syllable final is voiceless with superimposed glottal closure. Before pause it is unreleased, sounding a bit swallowed. (The phonemes d and g do not occur in these positions.) Examples: t'əbsén [t'əp̚sén] *raise it up*, həbkí [həp̚kí] *it was opened*, bab [bap̚] *paddle* (for a canoe), misíb [misíp̚] *broom*. Thus, the phoneme b contrasts with p and p' initially by voicing, but finally the contrast[6] is in the type of release; that is, /b:p:p'/ as [p̚:pʰ:p']. Compare seb [sep̚] *fast*, ?u číhob [?u číhop̚] *they made it*, pop [popʰ] *sleeping mat*, sop' [sop'] *it is light weight*.

The glottal stop ?, though somewhat unstable, is treated as a consonant since it parallels other consonants. It contrasts with other consonants between vowels: ča?ám *back teeth*, čahám *loose*, sá?ən *sharpen it*, sákən *hunt it*, bo?óy *shade*, bobóy *drooling*, to?esán *fix it*, top'esán *cause it to burst*, hú?ən *rub it* (*method of washing corn*), húyən *stir it*. It occurs in both a VC?V and V?CV series of phonemes, as do other consonants: pim?í *it got thick*, pos?í *it got pale*, krəš?í *he got angry*, la?mí *it got soft*, ?ahk'a?sá *he who takes others across*, ce?tán *laugh at*, ho?yán *war*. There is contrast utterance final between the presence and absence of the glottal stop: mač tó *not yet*, mač hin tó? *it is not a* (*kind of*) *leaf*, mač tóh *it is not true*; ?u té *he is coming*, te? *tree*; na? *mother*, nab *sea*, nah *he is full*, ?u nahá *his dream*; ča? *grindstone*, čab *brown sugar*; kə t'e?é? *I am hanging it out* (as clothes), t'e?é *hang it out*, t'e? *groin*. Phonemic contrast between glottalized stops and clusters of voiceless stops plus glottal stop is established in that in a cluster of voiceless stop plus glottal stop there is aspiration between the stop and the glottal stop: səp?ík' [səpʰ?ík'] *inhalation of air*, səp'ík [səp'ík] *let it dry up*; nat ?án *it is far*, na t'án *your word*.

The affricates contrast as to glottalization and to tongue position; c and its glottalized counterpart c' have an alveolar sibilant release, and č and its glottalized counterpart č' have an alveopalatal sibilant release. Examples: cílən *tear* (as cloth), c'ílən *split* (as palm), čuyú *sew it*, č'uyú *lift it up*, cahá *fry it*, čahá *drop it*, c'en *bed*, č'en *a well or hole*.

The ts and tš clusters are distinguished from the c and č phonemes in that in the clusters there is open transition (aspiration), syllable division, morpheme division, and potential pause between the stop and the sibilant. In the phonetic rendering of the following illustrations, a dot on the line will indicat syllable division and a hyphen will indicate morpheme division: pətsəktók' [pətʰ.-səkʰ.tók'] *egg shell* (səktók' *egg*, pət- *back* or *shell*, from the independent form pat *back*) in contrast with cucúm [tsu.tsúm] *hairy*; hutšán [hutʰ.-šán] *palm fruit* (hut *fruit*, *face*, šan *palm*) and kišhit'šán [k-iš.-hit'.-šán] *my female weaver of palm* (k- *first person*, iš- *feminine indicator*, hit'- verb stem *weave*) in contrast with kičán [k-i.tšán] *my uncle*. The tc and tč clusters contrast with the c and č phonemes in that in the

[6] In the coastal dialect of Chontal, as represented by the speakers of the town of Allende, the contrast of b and p' finally is neutralized. Only p' occurs finally.

clusters there is potential pause between the phonemes, in which case the first phoneme of the cluster is aspirated. In more rapid speech the t is unreleased before the c or č, but is held a bit longer than the first element of the c or č phoneme in its occurrence not in cluster: ʔu hut cimím *the horse's eye*, ʔunc'ít čɔ̀b *one candle*. I have found these clusters only at word boundaries.

The spirant f is labiodental and occurs only in a few Spanish loan words: kafé *coffee*, fóko *flashlight*. However, the more monolingual speakers usually substitute h or hw for the f of Spanish loans: kahwé *coffee*, hóko *flashlight*, hwérte from the Spanish fuerte *strong*, hóhoro from Spanish fósforo *matches*.

The spirants s and š are sibilants, contrasting at alveolar and alveopalatal points of articulation: sek'é *cut it*, šek'é *pierce it*; ʔu súli *he took the membrane off*, ʔu šulí *he broke it*; sum *rope*, šun *clay standard for the fireplace*; sis *it is cold*, šiš *crumbs*; ʔu bisí *he took it with him*, biší *he left*.

The spirant h varies from a glottal spirant, rounded before o and u, to a light front or back velar fricative. The friction tends to occur before pause, before ə (in which case it is a back velar fricative), and before i or following i in the same syllable (in which case it is a front velar fricative): haʔ [haʔ] *water*, həbɔ́ (xəbɔ́] *open it*, hek'é [hek'é] *divide it*, č'ihkáb [čix̬káb] *it is quiet*, č'uh [č'ux̬] *church*, bih [bix̬] *road*. When h is followed by a voiced consonant, there is a slight voiced transitional vocoid between the two consonants: ʔahlóʔ [ʔahᵊlóʔ] *boy*, ʔahyáh [ʔahᵊyáh] *a sick man*, ʔahmáʔ [ʔahᵊmáʔ] *buzzard*. (The phenome ə in these positions is longer and more prominent than the transitional vocoid: ʔahələknɨ *he was a long time*, ʔa həyí *you spread it out*, yáhən haʔ *water with nothing added*.)

The spirants w and y are voiced. The w is a labiodental fricative when occurring before i or e:[7] weʔé [veʔé] *meat*, wiʔná [viʔná] *famine*, wíču [víču] *dog*.[8] When occurring before a, o, u, ə it varies from [w] to a labiodental fricative which is velarized and slightly rounded: waʔá [waʔá] or [yᵛaʔá] *it is standing*. When the w occurs before consonants or pause, it is a labiodental fricative with velarization, rounded after o (I have not found occurrences of it after u before consonants or pause): šiláw [šiláv] *it is ugly*, čəklównesán [čəkloᵛnesán] *cause it to glow*. Frequently there is a voiceless offglide before pause: tikɔ́w [tikɔ́vf] *it is hot*. The phoneme y is nonsyllabic when preceding consonants or pause, and varies to a light fricative at the same point of articulation when preceding a vowel: yeʔéb [yeʔéb] or [yeʔéb] *mist*, wəyí [wəyí] *he slept*, čuybén *sew it for her*, hay *it is thin*, k'ay *song*, k'əyɔ́ *sing it*. The contrast of w and y is illustrated by wah *corn cake*, yah *disease*.

The nasals m and n contrast as to point of articulation, m being always bilabial, as in muk' *strength*, cimím *horse*, məkɔ́ *close it*. The n phoneme is actualized as an alveolar nasal [n], a velar nasal [ŋ], or the nasalization and slight lengthening of the vowel which precedes the phonemic n [ṽ·]. The velar allophone occurs before velar stops and pause: c'onkí [c'oŋkí] *it was shot*, tak'ín [tak'íŋ] *money*. The nasalization allophone occurs preceding š: ʔaránšaš [ʔarã́·šaš] *oranges*, ʔunším [ʔũ·ším] *one* (grainlike object), tənšín [tə̃·šín] *in the middle*. The velar allophone and the nasalization allophone vary noncontrastively before bilabials, h and ʔ: tan há [taŋ háʔ] or [tã· háʔ] *in the water*. In these positions the velar allophone tends to occur in slow deliberate speech and the nasalization allophone in faster speech. In the following illustrations, the phonetic form

[7] This rule does not hold for the Spanish loan words in my data, in which the phoneme w occurs between consonant and vowel, as in bwéno *good*, pwéde *possible*, and the pronunciation of some speakers of the word kafé as kahwé *coffee*.

[8] In the neighboring town of Tres Pueblos, the sound before i and e in corresponding words is a palatalized fricativized dental stop [dy], as in [dyeʔé] *meat*, [dyinɨk] *man*, [dyíču?] *dog*.

is given as it is spoken in the slow deliberate speech: čunwənón [čuŋwənóŋ] *I sat down*, ʔahkənmán [ʔahkəŋmáŋ] *he who is learning to make purchases*, tunʔók [tuŋʔók] *heel*. In the data there is a morpheme k'en which varies freely from [k'en] to [k'eŋ] when preceding the allomorphs ah- and iš-. The alveolar allophone occurs before vowels and before other consonants: noh *it is big*.

The m phoneme contrasts with the alveolar allophone of n initially and medially between vowels, but with the velar allophone of n utterance finally:[9] mahá *soak it*, nahá *dream*, muk *navel*, nuk *it is big*, čəmén *dead*, čənén *look at it*, mam *grandson*, man [maŋ] *purchase*.

In rapid speech the phoneme m is substituted for the phoneme n before bilabial stops, even across word boundaries; there is no perceptible difference in nasals before bilabials in rapid speech, even though at pause or in slower speech the distinction in phonemes is retained. I have chosen to write the phoneme which appears in the slower form.

The liquid phoneme l is an alveolar lateral: láčən *scratch it*, ʔaht'úl *rabbit*, c'əkəlín *cure*, k'ənc'alán *shiny golden*, ʔu p'íli kə níʔ *he scraped my nose*, woló *it is round*. The liquid phoneme r is an alveolar flap: búruš *bubbles*, čerbén *make it for him*, kirán *I look at it*, ʔu p'írik níʔ *its end*, p'oróš *rough*.

The phoneme r̄ is a trill. It occurs in only two native morphemes, and both these are onomatopoetic, referring to the imitation of a particular kind of sound. They are the roots r̄əm- as in r̄əmhulé? *to throw so that the object makes a whizzing sound*, and r̄ah- as in r̄ahəc'éʔ *to hit with a cracking sound*. However, the r̄ also occurs in borrowed words: ʔar̄ós *rice*, hár̄o *jar*, mor̄ál *shoulder bag*. In the borrowed words it is unstable, some speakers using a trill and others a flap. Preschool children not yet exposed formally to Spanish often substitute l or r for the trill of these borrowed words.

3. In the following distributional statement, those words which are obviously Spanish loans are not considered. Thus the phonemes f and r̄ are eliminated from the discussion here.

In emphatic speech no vowels occur utterance initially. In ordinary speech it is sometimes difficult to determine whether or not there is an utterance initial glottal stop, and word initially within the utterance the glottal stop may be completely lost.[10] If the glottal stop is completely lost, the word initial vowel may syllabify with the final consonant of the preceding word. This is especially true when the word initial vowel is a part of one of the following morphemes: ʔa *second person*, ʔu *third person*, ʔiš *feminine indicator*, ʔah- *masculine indicator*, ʔun- *one, a*. For the purposes of this paper, we have chosen to write an utterance initial glottal stop.[11]

Utterance initial syllables are of the following types: CV, CVC, CCV, and CCVC. Each of these syllable types also occurs utterance medially and utterance finally. The CV and CVC syllable types occur freely, but the CCV and CCVC syllable types are restricted to a few morphemes.

CV: čo *cornfield*, p'u *clay jug*, k'ohó *he is sick*, waʔokesán *cause to get up and walk*

[9] In the Allende dialect, the allophone of the n phoneme occurring before pause is alveolar, not velar.

[10] The same type of phenomenon is reported for several other Mayan languages. See, for example, Nadine Weathers, Morphological Analysis of a Tzotzil (Mayan) Text, IJAL 16.91–8 (1950); Eugene A. Nida and Moisés Romero C., The Pronominal Series in Maya (Yucatec), IJAL 16.193–7 (1950); Larsen and Pike, Huasteco Intonations and Phonemes, op. cit. (footnote 2). In Chontal, there is no contrast between utterance initial glottal stop and utterance initial vowel, but word initially within the utterance there may be contrast.

[11] Since within the same style of speech, we have not been able to find contrast utterance initially, initial glottal stop was not written in the former paper on Chontal: The Chontal (Mayan) Numeral System, IJAL 21.258–75 (1955).

around, bulíč *perspiration*, niʔcí *parent-in-law*, muklibá *burial place*.

CVC: c'ub *lazy*, mat *kind of duck*, cəmsén *kill*, k'uškí *it was eaten*, čúlub *rain water*, šiníč' *ant*, č'uhnínti*k let it be stored away*, k'ətk'ətné *continually asking*.

CCV: tyák'o *against it*, kwaʔán *what is there*, krómo *calendar*, winkré *men* (alternate pronunciation of winkəré), ʔankré *running* (alternate pronunciation of ʔankaré).

CCVC: trinčén *do it for spite*, kriš winík *angry man*, ʔankrén *run* (alternate pronunciation of ʔankərén), ʔahsyomté*ʔ a kind of tree*, káštran t'án *Spanish words*, krəšlé *anger*.

Within the utterance, between words, the additional patterns of CVV and CVVC occur: ʔu **šé u** yəlé*ʔ he is going to say it*, ʔuntú ahcó*ʔ a turkey gobbler*. The pertinent syllables in these illustrations are in boldface type.

In the data, there is one instance of a consonant constituting a syllable. In the stream of speech, the morpheme čič *affirmative* may reduce to č as in yáʔ.č.tra.ʔá.net *so you are here*. This is an alternate and more rapid form of yáʔ čič tra ʔánet.[12]

The syllable initial consonant clusters are tr, kr, kw, ty, and sy. Vowels occurring in syllables with an onset of two consonants are: i, e, a, o, ə. Examples are given above under syllable types.

Within the most frequently occurring syllable patterns, CV and CVC, any vowel may occur. Any single consonant may occur syllable initially, and all but d and g occur syllable finally. Any single consonant except d and g may precede any vowel. In words which appear to be of native origin d occurs only before a; g occurs in one word only, before o.[13] Following vowels within the syllable, in addition to the limitations of d and g, I have not found t' following a, nor c following a and i, nor r following a, o, and u, nor w following e and u, nor y following i. If two consonants of a CVC syllable pattern are both glottalized consonants, the second is always identical with the first.[14]

With regard to the occurrence of single consonants within the syllable, it is possible to show the consonants in five environments, except for d, g, and r, which do not have as wide a distribution as the majority (see below). In the paragraphs which follow, each of the consonants is cited with illustrations to exemplify, respectively, the following environments: (1) **CV-** (in which the syllable initial consonant is also utterance initial. The pertinent consonant in each formula is in boldface type), (2) -V.**CV**- (in which the syllable initial consonant is utterance medial following a vowel), (3) -VC.**CV** (in which the syllable initial consonant is utterance medial following a consonant), (4) -**VC**.CV (in which the syllable final consonant is utterance medial preceding a consonant), (5) -**VC** (in which the syllable final consonant is also utterance final).

For p: pək' *wart*, hápən *rescue it*, məkpám *lid*, cupsén *finish it*, k'umóp *royal palm*.

For t: tem *footstool*, máten *gift*, huštán *petticoat*, k'atbínti *he was asked*, tət *thick*.

For k: kun *chicken coop*, šukúb *horns* (*of*

[12] H. V. Velten has pointed out to me the parallel with English 'rapid clusters' in such an utterance as /ftstrú/ *if it's true*.

[13] The phonemes d and g are extremely rare in Mayan languages. They are not reported for Aguacatec, Pocomchi, Tzotzil, nor Chol. Only d is reported for Tzeltal, and in a private communication Marianna Slocum tells me that this d occurs only in Spanish loan words in the speech of some speakers; the tendency is still heavy toward substituting r for the d. In Huasteco and Tojolabal d and g occur only in Spanish loan words. See: Harry and Lucille McArthur, Aguacatec (Mayan) Phonemes Within the Stress Group, IJAL 22.72–6 (1956); Marvin Mayers, Pocomchi Verb Structure, IJAL 23.165–70 (1957); Nadine Weathers, op. cit. (footnote 10); Wilbur Aulie, High-Layered Numerals in Chol (Mayan), IJAL 23.281–3 (1957); Marianna Slocum, Tzeltal (Mayan) Noun and Verb Morphology, IJAL 14.77–86 (1948); Larsen and Pike, op. cit. (footnote 2); Julia Supple and Celia M. Douglass, Tojolabal (Mayan): Phonemes and Verb Morphology, IJAL 15.168–74 (1949).

[14] I became aware of this on reading Nadine Weathers, Tsotsil Phonemes with Special Reference to Allophones of B, IJAL 13.108–11 (1947).

an animal), k'ənkán *errand*, sukpékən *deceive*, pik *skirt*.

For p': p'iʔ *little*, náp'ək *leech*, həyp'é *how many*, ʔu sep'mán *it gets brittle*, ʔahsə́p *cricket*.

For t': t'ot' *snail*, hit'ók *his* (*her*) *spouse*, ʔaht'óʔ *heron*, hit'kí *it was woven*, yut' *tight*.

For k': k'ub *nest*, nak'áč *turkey hen*, hink'ín *then*, *when*, pok'mesán *cause to get fat*, nok' *cloth*.

For b: bak *bone*, hobén *drum*, k'əmbá *groan*, hibté ʔ *ladder*, keb *burp*.

For ʔ: ʔun *avocado*, toʔó *swamp*, təmʔí *it got deep*, hiʔtún *stone*, yuʔ *kind of nut*.

For c: cuk *hair*, picí *it is pretty*, tahcák *suddenly*, ʔu cuckibá *its patch*, cəc *hard*.

For č: čim *craw*, húčiʔ *type of shell*, ʔahčəmé *corpse*, pečkém *shoulders*, čač *basket*.

For c': c'ik *hill*, puc'é *flight*, həyc'ít *how many*, mic'tiʔín *sip it*, buc' *smoke*.

For č': č'ah *bitter*, háč'im *cocoa flavored corn drink*, ʔišč'upím *old lady*, šuč'kí *it was stolen*, č'oč' *salty*.

For s: sək *white*, pusú *mud*, ʔemsén *lower it*, ʔiskí *up*, kus *mold*.

For š: šoč' *owl*, ʔášuš *garlic*, ʔahšúč' *thief*, k'ušti ʔá *pain in the mouth*, piš *knee*.

For h: hiʔ *sand*, č'ahán *thin rope*, k'əbhút *tears*, nahyesán *forget*, ʔoh *sugar cane*.

For w: wič' *wings*, háwən *sister-in-law* (*of girl*), kəkwá *coconut grove*, səwkí *crisscrossed*, wiw *clay whistle*.

For y: yəš *green*, *blue*, č'úyub *whistling*, ʔahyə́š *crab*, soytáʔ *intestines*, coy *scar*.

For m: mək *spoon*, homóč' *corn husks*, pok'mí *it got fat*, c'ombá *gun*, helém *old*.

For n: neh *tail*, k'iná ʔ *hot water*, kisná *shy*, panté ʔ *farther ahead*, han *corn tassel*.

For l: luč *mosquito net*, húlaʔ *guest*, puhlé *pus*, yolmá *liver*, ʔal *heavy*.

The d occurs in the first three environments only (1, 2, 3, above): dáli *later today*, badá *now*, hindá *then*, *when*.

The g occurs in one environment only (namely, 3 above): ʔahčingolín *kind of bird*.

The r occurs in two environments (2 and 4, above): ʔahkiríc' *kind of bird*, čerbén *make it for him*.

Ambisyllabic consonant clusters, which result from the juxtaposition of syllables, are frequent and varied. In my data, each of the phonetic types of sounds, stops, affricates, spirants, nasals, and liquids, occur in cluster with each type, except that liquids do not occur in cluster with liquids. Of the theoretically possible clusters, many do not occur because d and g do not occur syllable finally. Another is missing because *hʔ reduces to ʔ; for example, yah *sore* plus ʔok *foot*, *leg* becomes yaʔók *sore on the foot or leg*. Neither have I found p', t', c', č' in cluster with each other, nor followed by ʔ, č, š. The phoneme k' does not precede p', and no glottalized stop precedes c. The phoneme w has been observed followed only by k, ʔ, n. Affricates are not followed by s or š.

Examples of ambisyllabic clusters beginning with stops include SS (both consonants in the cluster are stops): ʔəktán *stop it*, pokbénon *wash it for me*, c'iʔtán *ashes*, bək'tá *he is afraid*, bek'tá *flesh*; SA (stop followed by affricate): ʔu č'ukčikinín *he spies*, čikčikné *shivering*, pək'čín *soil it*, bek'č'úm *squash seeds*; SSp (stop followed by spirant): pəkhác'ən *set it* (as a hen), həksén *lower it*, t'əbsínti *it was raised up*, tikwesán *heat it*; SN stop followed by nasal): səkməlú *a kind of small fish*, k'eʔnesán *cause to increase in number*, t'ərəknesán *spin it*, ʔuk'nán *cry for*, šoyokné *going around in circles*, laʔmesán *soften it*; SL (stop followed by liquid): təklén *help him*, č'aʔlíb *something to lie down on*, k'ablesán *baptize*, ʔahc'ublé *lazy man*, ʔu muk'lé *its feathers*.

Examples of ambisyllabic clusters beginning with affricates include AS (affricate followed by stop): yəc'kí *it was squeezed*, huč'bénon *grind it for me*, šuč'kí *it was stolen*, pəčtíʔ *lips*, mačkaták *those who*; AA (both consonants are affricates): ʔahk'ečcimím *he who catches horses*, pəččán *snake skin*; ASp affricate followed by spirant): bič'yəlí *he ell head first*, ʔahhəc'hobén *drummer*, ʔu pečhəc'éʔ *he slaps him*; AN (affricate followed by nasal): ʔišhuc'nók' *she who washes clothes*, muc'muc'ná *constantly squinting*.

ʔahčučnók' *a kind of worm*, tič'mí *he got stiff*; AL (affricate followed by liquid): meč'lé *mischief*, weč'ləwé *kind of sound*, kəc'ləwé *kind of sound*, ʔahhic'lé *greedy person*.

Examples of ambisyllabic clusters beginning with spirants include SpS (spirant followed by stop): tahtóh *straight*, təskún *send him*, k'uškí *it was eaten*, cəypatín *follow*, wəybetán *keep vigil*; SpA (spirant followed by affricate): ʔišcúk *rat*, č'uyčikín *earrings*, ʔahčában *earthquake*, ʔahč'ahpéč *wood tick*, ʔahcé *rooster*; SpSp (both consonants are spirants): k'ušhutá *pain in the face*, ʔišsəkpəkə́ *dove*, ʔahwaʔáhtəne *wanderer*, ʔac'əyyəlón *I fell sliding*, ʔahwéčeʔ *termite*; SpN (spirant followed by nasal): ʔišmúč *toad*, hoshosné *wheezing*, mahnán *borrow*, pəhná *outside*, čəklownesán *cause it to glow*; SpL (spirant followed by liquid): pohlén *find it*, kušlí *he lived*, ʔišlotayá *she who accompanies*, ʔahlíč *kind of turtle*.

Examples of ambisyllabic clusters beginning with nasals include NS (nasal followed by stop): tunk'éb *elbow*, šəmbá *walking*, nəmtán *become accustomed to it*, čonkí *it was sold*; NA (nasal followed by affricate): hunč'əkní *it got light*, mončán *windpipe*; NSp (nasal followed by spirant): čəmsís *lukewarm*, k'ənhó *pillow*, čənhəbí *four years ago*, čənším *four (grains)*, ʔahkənənyá *watchman*; NN (both consonants are nasals): yumyumná *he is swinging it*, womwomná *he is barking*; NL (nasal followed by liquid): čumlíb *chair*, hənləwé *kind of sound*, tinlí *he bent down*, č'oyénla *get up (plural command)*.

Examples of ambisyllabic clusters beginning with liquids include LS (liquid followed by stop): čerbínti *it was done to him*, ʔəlták *they are all heavy*, ʔəlbén *tell him*, ʔirkí *it was seen*, t'elká *it is slanted*; LA (liquid followed by affricate): č'uʔulčén *bless him*; LSp (liquid followed by spirant): bəlšənó *covered with palm*, t'elyəlí *it fell in a slanted position*, t'olháʔ *waves*; LN (liquid followed by nasal): šəmbəlnesán *cause him to walk*, helmí *it got old*, čibəlnán *get drunk*, šəlnohó *shove him*.

4. As we have seen in section **2** above, Spanish loan words add new (as yet unstable) phonemes to the language. The distribution of phonemes is also affected. Single consonants are extended in their distribution in relation to the utterance and in relation to surrounding vowels. The phoneme r occurs utterance finally, as in boladór *skyrocket*; it also follows a, as in mardómo *manager*, from Spanish mayordomo.[15] The phoneme d occurs other than followed by a, as in doséna *dozen*, diksyón *injection*.

New consonant clusters are added: gl as in glóbo *kind of balloon*, kl as in kláse *kind*, gr as in pégru *Peter*, dr as in ladríyu *bricks*, mbr as in ʔómbre *man*.

A few vowel clusters within words are added: día *day*, pío ʔ *chicken* (an alternate pronunciation of píyó).

Other types of phonological changes which take place when Spanish words are borrowed into Chontal are the following:

Vowels in sequence are frequently separated by glottal stop. Thus VV > VʔV: Spanish seis > séʔis *six*, baul > baʔúl *trunk*, reuma > reʔúma *rheumatism*.

Utterance final o > u: músico > músiku *music*, pero > péru *but*, negro > ʔahnégru *negro* (the ʔah- is the *masculine person prefix*), chivo > ʔahčíbu *goat*, malo > málu *bad*. The u is retained when suffixes are added, as in máluhet *you are bad*. Utterance final o > uʔ: pito > pítuʔ *whistle*, trompo > trúmpuʔ *top*, pato > pátuʔ *duck*.

Changes of individual consonants occur. d > ʔ: soldado > soldáʔu *soldier*; h > s: reloj > relós *clock*; h > š: jabón > šápum *soap*; s > š: triste > tríšte *sad*, lástima > láštima *it is a pity*; r > l: Ricardo > rikáldo *Richard*.

Reduction of consonant clusters takes place: Bárbara > báta ʔ *Barbara*; fósforo > hóhoro *matches*.

Consonants become glottalized: toloque > ʔaht'olók *a kind of lizard*, trompo > trúmp'uʔ *top*.

[15] Spanish words are given in the traditional orthography.

Longer words are reduced to a typical Mayan root pattern CVCVC: machete > mačít *kind of knife*.

5. Stress is phonemic. Contrastive stress is shown by the following word and phrase pairs: ʔu p'ísi *he measured it*, ʔu p'isí *he wakened him*; ʔu c'óni *he believed it*, ʔu c'oní *he shot it*; ʔu c'ónihob *they believed it*, ʔu c'oníhob *they shot it*; mač ʔútik *let it not be done*, mač u tík *it won't dry*; ʔu hók'i *he dug it out*, ʔu hok'í *he called him*; ʔu súbi *he offered it for sale*, ʔu subí *he accused him*; ʔu súbihob *they offered it for sale*, ʔu subíhob *they accused him*; ʔa mukí *you hid it*, ʔamúki *he just bathed*; ʔák'əb *night*, ʔa k'ə́b *your hand*; čóno *a sale*, čonó *sell it*; ʔu lowí *he made a hole in it*, ʔu lówi *he made lots of holes in it*. In each of these examples, spoken in the neutral intonational contour, the stressed syllable is higher in pitch than the unstressed syllables.

In the following, spoken in a question contour, pitch[16] is excluded as a conditioning factor for stress, since in each phrase the first two syllables are low pitch and the last syllable high: ʔu c'óni *did he believe it?* and ʔu c'oní *did he shoot it?*; ʔu p'ísi *he weighed it?*, used when the informant was implying *are you asking me to say he weighed it?* and ʔu p'isí *he wakened him?* implying *are you asking me to say he wakened him?*; ʔu hok'í (*are you asking me to say*) *he called him?* and ʔu hók'i (*are you asking me to say*) *he excavated it?*.

Stress shifts[17] occur on some words. The stress may be phonemically on either of two syllables, yielding alternate pronunciations of the same word: tánet or tanét *hello*.

A phonemic stress may be lost entirely when the normally stressed vowel is lost in a phrase as a result of sandhi: ʔusubulót, an alternant of the more deliberately spoken ʔu subí u lót *he accused his companion*.

6. There are two length features, the emphasis feature, which we shall symbolize by ::, and the hesitation feature, which we shall symbolize by :. These features do not change the basic lexical[18] meaning of words, but rather add to the lexical meaning something of the speaker's attitude.

The emphasis feature, ::, is manifested by a combination of length and high pitch occurring on a stressed syllable. It indicates superlative degree, that is, intensification of the lexical meaning.[19] Note the following pair of utterances in which ʔák'əb means *night, at night*: ʔák'əb bišón tə wəyé *at night I went to bed* and ʔá::k'əb bišón tə wəyé *at night* (*very late*) *I went to bed*. In the following illustrations, the added significance of the :: feature is given in parenthesis in the translations: nánti *over there*, kɔ šéla ná::nti pat káh *let's go* (*way*) *over there back of town*; ʔupéte *all*, ʔupé::te kwántu ʔán *all things* (*just all sorts*) *whatever there are*; k'élen *many* (adjectival form), pan k'é::len botéya *on lots* (*really lots*) *of bottles*. This last illustration was taken from a spontaneously recorded conversational text by Rosa Pérez de la Cruz, and just following this utterance she goes on to repeat, but using the non-lengthened form of the word, k'élen t'ó̌šem botéya *lots of broken bottles*.

[16] For a discussion of phonemic pitch in a Mayan language (Maya of Yucatan), see Kenneth L. Pike, Phonemic Pitch in Maya, IJAL 12.82–8 (1946).

[17] The stress shifts in Chontal are somewhat parallel to stress shifts which occur in other languages. See Ethel Wallis, Intonational Stress Patterns of Contemporary Spanish (Hispania 34.143–7, 1951); Dwight L. Bolinger, Intersections of Stress and Intonation, Word 2.195–203.

[18] For lexical meaning versus intonational meaning see Kenneth L. Pike, The Intonation of American English, University of Michigan Press, Ann Arbor (1947), pages 20–5.

[19] This phenomenon is similar to the function of the length of the vowel in the English word 'long' in a phrase such as 'it happened a lo:::::ng time ago', or of the vowel in the word big in 'he was a bi:::::g bear'. For a treatment of this phenomenon in English see Pike, Intonation, ibid., page 97; also Pike, Language in Relation to a Unified Theory of the Structure of Human Behavior, Part II, Summer Institute of Linguistics, Glendale, California (1955), page 43.

There are two cases in my data in which this emphasis length occurs on a nonfinal syllable of a Chontal word which does not normally have the stress but which in this case is stressed: ʔu bišé uné *he is going*, but ʔu bí::še uné *he is (really) going*; həc'əkná *it tastes good* but hó::c'əkná *it (really) tastes good*.

When the emphasis feature occurs on the last syllable of an utterance, coinciding with stress, it may indicate exasperation on the part of the speaker, when he has had to repeat the same thing more than once: həyp'é:: *how much?* (second time asking); hop'ó *hat*, but čənén kačéʔ a kolesí kə hop'ó:: *look how you left my hat* (second utterance, when the person spoken to did not hear the first time). On repeat utterances of this type, if the stress of the word is normally on a syllable other than the last, it shifts to the last syllable, thus coinciding with the emphasis feature: ʔákum *sweet potato*, but after several utterances, ʔakú::m *sweet potato*!.[20]

The hesitation feature, :, is manifested by a combination of length and nonhigh pitch (in contrast with the higher pitch of the emphasis length feature) with fade-off and sometimes laryngealization. It may occur on the last syllable before pause regardless of where the stress falls. Occasionally it occurs without a following pause. In telling the story of a religious celebration, Catalino started a sentence, then paused to think what to say next, hesitating on the first word by lengthening the final vowel: ʔupéte: / winkréhob išiktákob *all, men women*. (The symbol / in this illustration and in illustrations to follow indicates pause). In the same text, a few utterances further along, the more normal form of the word *all* is used, ʔupéte. Note also the following, in which the same word is repeated, first with hesitation length and then without it: ʔu č'oyéhob tə: tə čumtó *they arise to, to sit*. In the following, the hesitation feature occurs on a stressed syllable: más ʔák'əb / ʔu yočé: / ʔu šé tə ʔočé: báyle *later at night it starts, it is going to start, dance*.

[20] Because of the stress shifts and the slight difference in meaning in these cases, these may represent a different contour. More data would be needed, however, to separate them, since at present there is not clear contrast.

SOME FINDINGS ON OAXACA LANGUAGE CLASSIFICATION AND CULTURE TERMS

María Teresa Fernández de Miranda, Morris Swadesh and Robert W. Weitlaner

Mexico City

0. Introduction
1. Classification and chronology
1.1. Recent relations
1.2. Distant relations
1.3. Remote relations
2. Cultural cognates
3. Borrowed words
4. Geography and linguistic traits
5. Place names
6. Kinship terms

0. This is an abridgment of the report presented by the authors in the Round Table Conference of the Sociedad Mexicana de Antropología, held in August of 1957 in the city of Oaxaca, with the theme of 'Oaxaca and the Isthmus of Tehuantepec'. The authors were asked by the Consejo de Lenguas Indígenas to prepare a brief, ethnologically-oriented review of linguistic knowledge of the area, and the title chosen for the paper was 'La Panorama Etnolingüística de Oaxaca'.[1]

It would have been the desire of the authors, as of the Consejo de Lenguas Indígenas, to include, for the present and for the whole gamut of earlier times—insofar as it is possible to obtain or infer them—the main facts of language usage and of customs connected with the use of this instrument in each community and above all the circumstances of verbal inter-communication among the separate communities. Language differences and language relationships would be an important part of the study, but only one of several equally important parts. However, the panorama which we are able to present today is necessarily very incomplete. The number of languages and dialects today is great, and in early colonial times was much greater. There have been studies, at first mainly descriptive and later comparative as well, from the days of the friars; but the first efforts were limited to selected dialects of some of the languages, important for communicating with large populations; there has since been a constantly but only very gradually increasing coverage. The problem of preparing a general report on the languages of the whole region was discussed four years ago in the Consejo de Lenguas Indígenas immediately after the theme of the present Conference was chosen. A plan was formed for rounding out the information in various respects, including particularly the classification of languages and dialects; place names; the movement of loan words among the native languages and between them and Spanish; kinship systems; facts of cultural prehistory reconstructible from the study of contemporary culture terms. Unfortunately, it was impossible to begin any well-organized program of research until late in 1956, that is, less than a year ago. Members of the Summer Institute of Linguistics and some

[1] There are evidently considerable differences in what scholars consider to be the indispensable content of ethno-linguistics. In the monograph, Language in Culture, Proceedings of a Conference on the Interrelations of Language and Other Aspects of Culture (Anthropological Association, memoir 79), the main focus of attention is on the impress that language categories may give to the outlook of a people and only passing attention is given to the problems of the type mainly implicit in our report, namely, the reflection of culture history in the distribution and affinities of languages and in the stock of culture terms. We did not exclude other problems to minimize their importance but because of the unavailability of directly usable data.

official agencies and individual Mexican and foreign scholars carried on various studies, which have contributed to the present report. Only toward the end of last year was the Consejo's 'Oto-Manguean' project launched to help fill in the gaps of knowledge regarding the most widespread and difficult linguistic group in the area. Standard forms, covering both basic words and culture terms, were prepared to facilitate collection and comparison of the data and particularly to guarantee that there would be comparable material for all the dialects. These lists were completed for about 50 languages and dialects through the joint efforts of students of the Escuela Nacional de Antropología, linguists of the Instituto Nacional Indigenista, and workers of the Summer Institute of Linguistics, and additional data were available from previously recorded manuscript records and from published works. These served as the basis for comparative studies by students in the Oto-Mangue seminar of the Escuela.

In June of 1957, a Semana Lingüística (Linguistic Week) was held in Mexico City for the presentation of linguistic papers. This report is based in large part on works presented there,[2] with additions based on studies of the three authors. If our report is uneven, it is because the shortness of time has made it impossible to give proper attention to the different aspects of ethnolinguistics. We have attempted to give a fairly rounded and detailed account of linguistic classification with a few notions of its implications for prehistory. We are also able to give a general synthesis on kinship, and to report the reconstruction of ancient prehistoric culture in the Mixtecan micro-phylum based on the work of Millon and Longacre. As for other topics, we can offer little more than brief comments.

1. A principal concern of the Semana Lingüística was to reach some clarity on the value of the lexico-statistic method as an instrument of linguistic classification and chronology. The general concensus, though perhaps not entirely unanimous, was that the method is reasonably effective, but requires certain cautions, particularly: (1) it should be used with the best available knowledge of phonology of each linguistic group; (2) the method needs further improvement; (3) dates are to be regarded as approximate; (4) the divergence figures are minimum centuries, abbreviated mc., and the real date may be much farther back.[3]

1.1. Recent relationship is usually obvious, but lexico-statistics and other scientific methods are useful for distinguishing degrees of recency. We give below divergences in Oaxaca in groups whose relationship is obvious because they contain only dialects with divergences no greater that 25 mc. with respect to their nearest congeners.

In several cases we deal with undifferentiated single languages, either because serious local variation did not exist or because we lack data on the dialects. Such is the case with: Amuzgo, Huave, Chontal of Oaxaca. For Trique, divergent dialects have been reported, but we do not have material on which to base a lexico-statistic estimate.

For Cuicateco, divergences up to 9 mc. have been reported.[4]

For Chinantec, divergences up to 12 mc. have been reported.[5]

Nahua in precolonial and colonial times was a general lingua franca, and was natively spoken in two separated parts of our

[2] Still in press but shortly to appear under the title of Gloto-Cronología y las Lenguas Oto-Mangues, Cuadernos del Instituto de Historia, Universidad Nacional Autónoma de México. Inciting papers from this volume, we use the abbreviation GLO.

[3] See M. Swadesh, Towards Greater Accuracy in Lexico-Statistic Dating, IJAL 21.121–37 (1955).

[4] Evangelina Arana Osnaya, Divergencias Internas del Mixteco y del Macromixteco, GLO.

[5] Roberto Escalante y Thomas Stanford, Divergencias Internas del Chinanteco, GLO.

area, namely Pochutla (on the Pacific) and the Gulf coast. Pochutla Nahua (now extinct) was the most divergent, with no other dialects close to it. Other Nahua dialects grade into each other, with only 5 mc. of divergence between such geographically distant dialects as San Salvador and that of San Andrés Tuxtla. Divergences for the entire family run up to about 14 mc. between extreme dialects. Pochutla shows 9 mc. of divergence from its nearest congener.[6]

Popolocan consists of two discrete parts, Mazatec with divergences up to 9 mc. and Chocho-Popoloca-Ixcateco with as much as 12 mc. Between Mazatec and the second division, the divergences are 23–24 mc.[7]

Mixtec covers a considerable area and has many local forms. The dialects are largely inter-graded, with the highest calculated divergences around 15 mc. Where the area is broken by Cuicatec, the latter appears to be an intrusion. Divergences between Mixtecan and Cuicatec are 25–31 mc.

Chatino-Zapotecan falls into two parts, Chatino showing almost equal divergences, 18–20 mc., from all of the many Zapotecan dialects. The latter show intergrading. divergences up to 16 mc. among themselves. Isthmus Zapotec is evidently a late colonization from the valley, going back perhaps six centuries. Chatino must have been well separate from Zapotec for a considerable period, even though it is now in contact with a part of the latter area.[8]

Mixean dialects are known by the names Mixe, Zoque and Popoluca in different areas, but this division appears to be geographic and cultural rather than linguistic. The entire group shows intergrading divergences indicating long existence as a series of local dialects, with more serious displacements in a few cases. Despite mutual intelligibility between adjacent types, the divergence reaches as high as 37 mc.

1.2. As ordinarily distant (cf. remote, below) relations, we count sets of language groups in which the points of closest contact, linguistically speaking, fall between 26–50 mc. The highest divergence in some cases goes beyond 50 mc., which suggests that the actual age of the group is correspondingly greater, but the relationship is not too hard to establish because of the presence of languages with intermediate degrees of relationship.

Amuzgo, Cuicatecan, Mixtecan and Trique form a stock with a top divergence of 49 mc. between the first and the last. Cuicatecan and Mixtecan are 25 mc. divergent from each other, if we take the dialect of each that is least different from the other group, and 31 mc. if we take extremes. Cuicatecan diverges 41 mc. from Trique, 45 mc. from Amuzgo. Mixtecan shows 29–35 mc. from Amuzgo, 35–39 mc. from Trique.[9]

Nahua is the southernmost member of the Uto-Aztecan stock, whose divergences reach up to 47 mc. (Nahua-N. Paiute). The closest congeners were presumably Caxcan and Tecoxquin, now extinct. After them, come Cahita, 27–29 mc.; Huichol, 30–31 mc.; Papago, 36 mc.; Cora, 36–38 mc. Evidently there was little dialect divergence in Nahua at the time it lost contact with these languages.[10]

The closest relations of Chontal are to Comecrudo and Cotoname, with divergences of 39 and 42 mc., respectively; Comecrudo-Cotoname shows 35 mc. Evidently there was little divergence between the latter two when they became separated

[6] M. Swadesh, Algunas Fechas Glotocronológicas importantes para la prehistoria Nahua, Revista Mexicana de Estudios Antropológicas 14.173-92 (1954).

[7] María Teresa Fernández de Miranda, Glotocronología de la Familia Popoloca, Serie Científica del Museo Nacional de Antropología, número 4, 1956.

[8] José Rendón Monzón, Relaciones Internas de la Familia Zapoteco-Chatina, GLO.

[9] Arana Osnaya, op. cit.

[10] M. Swadesh, Algunas Fechas Glotocronológicas, cf. note 6.

from Chontal, an event going back more than three thousand years.[11]

Mixean seems to have a distant congener in Lehmann's 'Aguacatec II', but the vocabulary of the latter is too fragmentary for a reliable count. There appear to be 40–60 mc. of divergence.

1.3. For the last half century comparative linguistic study has been finding more and more connections among Amerindian linguistic groups. By now it appears possible that all of them may have diverged from a single set of dialects in the last 15,000 years. To trace so ancient a relationship, we have to find points of reduced divergence, presumably reflecting the cases of greatest and longest contact among the diverging tongues. In Oaxaca we find at least three series of language groups showing discernible though very distant relationships.[11]

The previously proposed Oto-Manguean phylum does not hold together definitely, because the Manguean division appears to fit better elsewhere. Chinantecan also is fairly separate but appears to come close enough to Mixtecan (71 mc. relative to Amuzgo) to be taken with the remaining 'Oto-Manguean' divisions. This leaves a set made up of Otomi-Pamean joining Mixtecan, and the latter touching Popolocan (59 mc.), Chinantecan (71 mc.) and Chatino-Zapotecan (57 mc.) in three other directions. The last named group has discernible affinities with Huave (60 mc.), if the preliminary findings of Swadesh are born out. The closest other contacts of Huave, are with Misquito (57 mc.) of the Misupan group of Central America, and with Tarasco (59 mc.) of Michoacán. Excluding Manguean from 'Oto-Manguean', we may term the remaining complex Oto-Zapotecan, or, with the inclusion of Huave, Oto-Huave. Purely as a matter of convenience, we exclude Misquito and Tarasco and the languages following each in their respective chains of relationship.

Mixean fits into a sequence of linguistic groups beginning far to the north with Tsimian of British Columbia and eventually making contact with Misupa in Central America. The closest divisions with relationship to Mixean in three directions are Wintu-Maiduan ('Palpenan') of California, 59 mc.; Totonacan of the Gulf coast of Mexico, 60 mc.; Mayan of Mexico and Guatemala, 59 mc. It is convenient to let the name Penutian include the Tsimsian-Mayan sequence.

The Chontal - Comecrudo - Cotonamean stock ties up in one direction with Jicaque of Honduras (Chontal-Jicaque, 53 mc.), and elsewhere with Tonkawa (Cotoname-Tonkawa 46 mc.) and with Seri (Comecrudo-Seri, 53 mc.). This places it with Sapir's Hokan-Coahuiltecan classification. A sharper break between Comecrudo and Atakapa (68 mc.) suggests that it may be convenient to keep the Gulf languages apart.

Uto-Aztecan is related to Kiowa-Tanoan in the north and Chibchan in the south, with points of least separation 60 mc. both for Comanche-Jemez and Nahua-Rama.

2. Once the common origin of a group of languages is established, the possibility is opened up of determining details of the old culture of the group in its common period, on the basis of cognate culture elements, or in other words those which appear in two or more of the derived languages in phonetic shapes which imply their derivation from the same original word. A fine contribution along these lines was made in the Linguistic Week by Longacre and Millon[12] in their reconstruction of the culture of the common period of Mixtecan, which lexicostatistics places about 50 centuries ago. They show cognates belonging to the areas of agriculture, ceramics, religion, and trade. Archaic forms

[11] M. Swadesh, Materiales para un Diccionario Comparativo del Filum Penutioide, Cuadernos del Instituto de Historia, in press.

[12] Roberto Longacre y René Millon, Análisis Cultural de los Vocabularios Mixteco y Macro Mixteco, GLO.

for *masa* (*corn dough*) and *metate* show the early use of maize. Words for *weave*, *loom*, *net*, *mat* and *basket* bespeak an old weaving pattern. *Town* and *market* suggest fixed settlements and commerce. These points confirm and supplement recent archeologic findings and open the way for further research.

3. No systematic study has been made of word borrowings among the languages of Oaxaca, but this is unquestionably an area requiring study, because of the evidence it may give of old contacts among the peoples.

4. Some impressions of linguistic geography were obtained by participants in the Oto-Manguean seminar, but the study did not reach any point which would justify a report. It is recommended that such a study include the geographic distribution of different types of consonants and vowels, of accent and tone of different types, of noun classifiers (animals, plants, etc.), the order of elements in composition, consonantal alternation with and without vowel change, reduplication, certain inflectional categories.

5. A collection was made of place names in various of the languages. It was found that all the languages use a great many Nahua names but there are also quantities of native expressions in each of the languages, often as an alternative to the Nahua term but many times as the only expression. The Nahua name, even when known, is not necessarily the one that is used ordinarily. In most instances, the toponymic is a compound with a clear meaning, and the usual case is that the meanings are parallel in Nahua and the native language. Important places may have names in various of the languages. Some of the names are unanalyzable and meaningless, perhaps because they are archaic native terms or because they are based on different languages. Though rare, the last mentioned type of instance should eventually prove the most interesting, since such items may provide evidence for earlier occupancy of the region by other groups. However, the study was not carried far enough to give concrete results in any but scattered instances.

6. An effort was made[13] to reconstruct the kinship system of some of the Oto-Zapotecan linguistic groups. An interesting observation was that in each case there is usually uniformity of terms in languages of recent differentiation, up to about 2,000 years, but considerable variation in relationships going farther back. This may indicate a radical change in the prevailing kinship system at about the time depth indicated. A correlation seems to exist between kinship stability and fixed settlement patterns.

The kinship of the recent period is, without exception, bilateral of the Hawaiian type, recognizing relationship both on the paternal and the maternal side. There is little preference of one side over the other, except perhaps for the paternal in matters of residence. In speaker's own generation, older and younger siblings and cousins are sometimes distinguished. In contrast to some other Amerindian groups, the uncle is kept apart from the father.

Going beyond the recent period, there are always a few terms which coincide in more than one linguistic division and it seems that some of the terms for siblings, parents and children are cognate. Sometimes the same term is used in different meanings in the different divisions, with interchange between siblings and avunculars. This suggests that there may have been a classificatory system combining collaterals of different generations.

[13] Herbert Harvey, Reconstrucción de Algunos Sistemas de Parentesco en el Grupo Lingüístico Oto-Mangue, GLO.

NOTES AND REVIEWS

Paul Rivet

1876–1958

The Editors announce, with great regret, the death, in Paris, of Dr. Paul Rivet. Dr. Rivet, for many years the Secretary-general of the Musée de l'Homme, was well known for his ethnographic and linguistic researches in the Americas. He was associate editor of the International Journal of American Linguistics since its first appearance; he published several score papers and monographs (mainly in L'Anthropologie, the Journal de la Société des Américanistes, and Anthropos), and he participated with Professors Meillet and Cohen, in the encyclopedic Les Langues du Monde. We should also mention his volume on Les Origines de l'Homme Américain (1943, 1957) and his monumental Bibliographie des Langues Aymara et Kechua (1951–56). Dr. Rivet will long be remembered for his pioneer studies of the numerous Indian languages of South America, and for his provocative studies relative to the origins of the American Indian.

Possible Athabascan Influence on Yuki

A. L. Kroeber

Recent analysis of the Yuki language materials recorded in 1931–32 from Ralph Moore in collaboration with the late Hans Uldall reveal three structural traits more or less reminiscent of Athabascan. These traits are: tonality; a strong tendency toward monosyllabic morphemes; multiple forms taken by verb stems. The historic Athabascan languages of California are not tonal, but they may once have been; in California these languages had entered an area of prevailingly toneless speech. The morphemic monosyllabic trend of Yuki is just about as strong as that of Kato, Wailaki, and Hupa, the two first of which were in historic contact with Yuki. As to multiple stem forms, Yuki mùhš, mūš, mù·š, *smile*, or kā·, kà·, kā?, kà?à, *to snow*, roughly parallel Kato yai, ya, yaš, *go*, or lag, lah, leh, *do*. There are striking differences too. The mostly polysyllabic verbs have the stem in final or near-final position in Athabascan, initially in Yuki. I have also observed neither loan words nor seeming cognates. So I am not thinking at all of ultimate genetic relationship. The Athabascans seem to have been in California less than a thousand years, in which time their languages and Yuki could not have become so different in content as they are. If there is more than coincidence at work, it must have been influencing by contact. As an isolated relict, Yuki long has been eyed or tentatively claimed for both Penutian and Hokan, which are so prominent in native California. It may well turn out to be an ancient offshoot from either: I have no opinion. But I suggest that before a decision is made by analytic comparison, it may be necessary to consider also a relatively recent overlay of Athabascan influence on Yuki. And in turn a Yuki influence on Kato and Wailaki may be discernible, helping to differentiate them from other Athabascan.

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On the Format of Phonemic Reports, with Restatement of Ocaina[1]

Charles F. Hockett

1. An Ocaina word[a2] consists of a series of syllables. Each syllable consists of an onset followed by a peak.[b]

An onset consists of a single consonant. In the table below, the consonants preceded by a hyphen occur as onsets only in

[1] Arlene Agnew and Evelyn G. Pike, Phonemes of Ocaina (Huitoto), IJAL 23.24–7 (1957).

[2] The superscript letters are cross-references to the discussion in **2**.

non-initial syllables. Also, there is no contrast between initial /ʔ/ and zero (i.e., word-initial vowel).[c]

Obstruents and sonorants:[d]

p	t	tʸ	k
b	-r	dʸ	g
	ɸ	č	
	ʒ	ǯ	
p	s	-š	x
b		-ž	
m	n	ñ .	

Laryngeals: h, ʔ.

A peak is free or checked.

A free peak consists of a single vowel or of a sequence of two vowels, each with its own tone, and the whole either oral or nasal.

The vowels[e] are:

i ï o

e a .

The tones are high (/ˊ/) and low (unmarked). Some, at least, of the two-vowel sequences are attested with all four possible combinations of tone: thus /áá/, /áa/, /aá/, /aa/.

Apart from tone, the occurrent free peaks are as follows, where "O" and "N" mean, respectively, attested only orally and attested only with nasalization:

i	ii		io (O)		
ï		ïï			
o	oi (N)	oï	oo	oe (O)	oa
e (O)	ei (O)			ee (O)	
a	ai	aï (O)			aa.

A checked peak consists of the material of a free peak, as described above, plus /ʔ/ or a nasal consonant. Those with /ʔ/ occur finally, and medially before certain onset consonants in the next syllable: /t tʸ k b g ɸ č s š x ž m ñ/. The type with checking nasal consonant occur only before a homorganic nasal onset consonant in the next syllable, thus only nonfinally: /-mm-/, /-nn-/, /-ññ-/.[f]

2. There are various reasons for the study of "obscure" languages spoken in far corners of the world. But there are relatively few reasons why reports on such languages should be published. Perhaps the most important reason for public report is that each new bit of information contributes, often trivially but sometimes crucially, to our slowly emerging understanding of the nature and variety of human speech habits. If phonemic reports are to serve this aim well, there are a few minimum standards which they should meet. They should cover the phonological facts of the language succinctly, completely, and with crystal clarity. If, in addition, the reporter wishes to include data of other than a strictly phonological sort, or to illustrate one or another point of method or theory, there can certainly be no objection; but such addenda should be segregated from the report proper. If completeness is impossible because some of the facts are not yet known, a tentative report may nevertheless be justifiable; but the lacunae should be overtly indicated. Any field worker's training will lead him to solve certain problems in one way rather than in other possible ways; but insofar as possible the facts in a report should be sufficiently detailed to enable linguists of other theoretical predilections to reinterpret the analysis in their own favorite terms.

To illustrate these points, I have chosen a recent field report (see fn. 1) which recommends itself for the purpose on two counts. First, I know that its authors will understand the constructive intention of the criticisms, and will thus not be offended. Second, the report is neither so perfect as to preclude suggestions for improvement, nor so terrible as to render attempts at reorganization fruitless.

One serious fault of the Agnew-Pike report, as of a good many recent phonemic reports, is its organization and style. In §1 of this paper I have suggested, by example, what I believe would be a much clearer format for the presentation of the system, as, indeed, in a general way, for the presentation of any system. The rewrite changes the interpretation of a few

points, and states definitely a few points on which the original report is indefinite; but the altered format itself does not rest on these changes, and the latter will be dealt with later.

The rewrite omits certain things included in the original: phonetic details, examples, some of the distributional information, and some scattered morphophonemic observations. The first and second of these obviously belong in a full report. I would feel that phonetic details are better given in a separate section after that which outlines the units and their occurrent arrangements, rather than scattered through the description of the patterning. Examples, on the other hand, need to be inserted wherever any reader might want them. I omitted such distributional information as seemed to me probably to be the result of sporadic rather than systematic gaps—for example, the non-occurrence of /š/ initially in a syllable checked by /ʔ/; but this is a score on which it is better to run the risk of irrelevancy than that of incompleteness. At the same time, the way in which the presentation of distributional information is handled in the Agnew-Pike paper does not strike me as very felicitous. It applies a simple syllable-tabulating procedure to Ocaina, without any effort to determine just how, or with what modifications, that general procedure is relevant for the particular language. As to the partial morphophonemic remarks made by Agnew and Pike—if included at all, they belong in a separate section.

The following are comments tied to specific points. The boldface lower-case letters are a cross-index to the superscript letters in §1.

a. Agnew and Pike describe phonemic patterning within a domain labelled the "word," without specifying just what their "words" are or how they are relevant phonologically. We are forced to do the same in the rewrite, but it leaves certain points in doubt. For example, on p. 26 of their report there is cited the phrase /ihï ása óxï/ *he cooks a lot.* We do not know what the spaces in this notation represent phonetically. If they represent nothing, then we have here instances of the two-vowel sequences /ïa/ and /ao/, neither of which is listed in the original description. If the spaces represent some concatenation of phonetic phenomena that could be recognized (by a linguist who works that way) as an open juncture phoneme, then the "words" of the original report are valid domains for phonemic analysis for those who disagree with Pike's "grammatical prerequisites" as well as for those who agree therewith. Or, if space before a consonant letter represents nothing phonetically, while space before a vowel letter represents something that could be interpreted as an allophone of /ʔ/, the story is still different.

I should like to make it clear that I am not here arguing as to whether Pike or his opponents are "correct," in some ultimate sense, about the phonological relevance of grammatical boundaries. Those who subscribe to either (or any) side of this theoretical argument must be equally free to do field work and write field reports on the basis of their own theoretical convictions. But it does not require any great amount of additional effort for a worker of any theoretical predilection on this score to supply, in a report, the phonetic facts on the basis of which those who disagree with him can reinterpret. I think we have the right to petition that this be done.

b. The terminology of onset and peak is here applied in a partly arbitrary way. It would be equally satisfactory to use some other term in place of "peak," and then to say that the things named by the other term are of two types, one consisting of peak alone, the other of peak plus coda. The point is that the internal evidence clearly shows a closer tie between vowel (or two-vowel sequence) and following tautosyllabic consonant than between the former and preceding syllable-initial con-

sonant. This fact should be utilized to the full in the description of the patterning.

c. Agnew and Pike imply that /ʔ/ occurs initially. But no examples are given, whereas there are many examples of initial vowel; and the reader has the right to be suspicious. Contrast between initial glottal catch and initial "smooth vowel" is very rare, as languages go. If a field worker really finds it, he must underscore its presence and give examples.

d. I use Agnew and Pike's symbols. If /r/ is being paired with /t/, then "d" would be a better choice of symbol; its flaplike nature can be specified in the phonetic description.

Tabular presentation is far clearer than listing and description in solid paragraphs. Often it is not necessary to make trouble for the printer by requiring headings for rows and columns, since the choice of symbols, if judicious, can supply most of the information that headings would give. Also, the assembling of a table forces the reporter to pose certain questions, which ought to be asked even if the answers turn out to be arbitrary. Thus, I could not decide in the present case whether the affricates should be entered as two additional columns in the rows with the stops, or as two additional rows in the columns with /t/ and /tʸ/. There is no distributional evidence to help. I made the second choice only because of the seeming symmetry of /t/ : /ŧ/ : /s/ :: /tʸ/ : /č/ : /š/.

A glottal catch should rarely, if ever, be classed with voiceless stops, as Agnew and Pike do in words (rather than in a table), and as many recent reports do. Also, it is probably mnemonically unwise to call it a "glottal stop." An "ordinary" stop involves a closure somewhere in the oral cavity, together with velic closure, and then allows of such difference-making phenomena as voiceless and voiced, plain and glottalized, and the like. These contrasts are impossible for a glottal catch, which also remains necessarily the same to the ear (and phonemically the same) whether the velic is open or closed. Possibly in accord with these physiological facts, in almost all languages that have a glottal catch as a phoneme (or as an allophone of some phoneme), it patterns differently from "ordinary" stops. There are a few languages, to be sure, in which a glottal catch has just the privileges of occurrence of most or all the other consonant phonemes; Huichol seems to be one. But even here, potentialities for allophonic variation or historical change are sharply different for the glottal catch and for the "ordinary" stops, so that segregating the former is probably still advisable.

e. The tabular arrangement is deduced from the phonetic description in Agnew and Pike. It implies a two-way contrast of tongue-height, with a front-back contrast at both heights and a further unrounded-rounded contrast for high back. Possibly, of course, the proper arrangement is rather:

i ï
e o
a

If my interpretation is correct, then "u" would be a better symbol than "o." If the alternative just given is correct, then probably "u" should be used instead of "ï."

f. This treatment eliminates the three extra phonemes /M/ /N/, and /Ñ/ set up by Agnew and Pike, and is possible (though perhaps not correct) in the light of the distribution of these three stated in the original and of the phonetic properties described for them.

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ON DIALECTAL DIVERGENCE IN ISLAND CARIB

DOUGLAS TAYLOR

Three hundred years ago, the same language—if we are to believe the statements of contemporary French missionaries who were in a position to know—was spoken throughout those of the Lesser Antilles from which the Indians had not yet been

expelled; and twenty years ago a Dominican Carib woman—then about seventy—told me that her own mother, a native speaker of Vincentian Island Carib, had found no difficulty in understanding or in making herself understood by native speakers of the Dominican dialect, though admitting that the latter differed in some respects from her own. To judge by Ober's unpublished word-lists of Vincentian and Dominican (recorded in 1877, and kindly made available to me by the Bureau of American Ethnology), Rat's short description of the latter dialect (Journal of the Anthropological Institute of G.B. and Ireland, vol. XXVII (1898), pp. 293–315), and my own gleanings from both islands, made some forty years later when no native speaker remained, these differences mainly concerned phonology and syntax; though vocabulary and morphology seem to have been affected to some slight extent. So, for example, Vincentian: bádi *hut* but báti *thy elder brother*, údu *fish*, uátu *fire*, bicógo *thy head*, ícига *to give* and bíciri *thy nose* correspond to contemporary Dominican: báti and báti (homonyms), útu, uátu, bisóko, ísika, bísiri; and to modern Central American Island Carib: bádi, báti, údu, uátu, bicógo, ícига, bígiri. (The spelling of Vincentian and Dominican forms has been "normalized" to conform to that employed in my phonematic transcription of the Central American dialect: o = mid back unrounded [ë], c = palatal hushing affricate [tš], etc.)

The Vincentian dialect and its Central American offshoot can have begun to diverge only since the deportation of 1797; and it is therefore not surprising if the former (as of 1877) resembled the latter (as of 1947) more than it did contemporary Dominican. Nor do the phonetic and phonological differences among the three appear very remarkable until the historical record obliges us to conclude that, for example, ísiri > íciri > ígiri *nose*, and not, as common sense would seem to demand, the reverse (ígiri > íciri > ísiri). I have tried to account for such anomalous changes elsewhere (in Word 14.1). Here I should like to illustrate and discuss some other differences between recent Dominican and the modern dialect of Central America; and for this purpose I give a brief Dominican text—the first of four such recorded and published by Rat; but with the spelling "normalized" as stated above—together with a translation into his own dialect by one of my Black Carib informants in British Honduras.

Dominican text

1. hália lúba nerémeta Baraísiri líą líri. 2. kąianítina núma, uáma bíąbri níbaią: bíama uokória, bíama uória. 3. niuatakímare nátoka iámati, nasuáhaią lúni uéue, niútiri atíaha. 4. níani eremétatu áutubu, takusákuią, tabuáhaią áikini, tasibákuią, tahoróhaią kíere, tahulúhaią báruru, tabuitáhaią batíruku, tiuátakimária tísari. 5. níbaią súhanų uáita. 6. ábana líha uókori uairíhali, liuátakimária luníkua. 7. nukúsuru karípunaiąru, múlatuiąli nukúsili. 8. napúkasa Uarísima. 9. láuseę alúaha níani, niútiri Baraísiri. 10. iąhį nhapúkasa sų níbaią.

Central American translation

1. (n)iéį lubái nerédera B. líą líri. 2. gámaritina, uámaianų gádoro uaráhǫią: bía uogória, bía uorįia. 3. tadóga iamádi nuádigimáribai, nácuahąią uéue, nídi adíaha. 4. númari erédetu uábię, táhocagųią, tábuag(u)ią áigini, tacíbagųią, táhorohąią giére, táhuduhąią barúru, tabuídahąią mú(o)nada, tiuádigimária ticári. 5. uáinamuhąią sų uaráhǫia. 6. uáiri(h)ali ábą hádagię uogória, luádigimária lúgua. 7. garífunaiáų núgucu, muláduiáį núguci. 8. nágurua U. 9. láugię áluaha númari, nídi B. 10. (n)iéį hágurua sų uaráhǫią. What appears to me as the most striking difference between this text and its Central American translation is word-stress, which is distinctive in the latter dialect, but which Rat believed to be automatic (although he wrote it) in recent Dominican, always falling, according to him, on the antepenultimate syllable or, in shorter words, on the first syllable. This

pattern may well have predominated by and large; but we must reject its automaticity when we find that Rat, in order to make the language conform to his "rule," sometimes separates what should be joined (so: "wa múti" for uamúti, an auxiliary verb in which uA- is the prefix marking first person plural), joins what should be separate (so: "kutawaháluba" for kúta uahá luba *when we have burned*, a phrase containing the personal prefixes uA- *1st pl.* and 1- *3rd masc. sg.*), and plays with the idea of changing the spelling and fall of stress of "*nakusákuya*, which might be written *nakusakúia*." And if Rat's marking of stress is unreliable, there is little point in discussing apparent divergence in this respect between the two dialects.

Of the segmental phonemes that I find in the Central American dialect, all except /p/ and /k/ (which have a very limited distribution) occur in the above translation; and I believe that all the segmental phonemes of recent Dominican, with one probable exception, appear in the text. Now it should be noted that the aspirate h, in text and translation alike, corresponds to an h of Raymond Breton's extensive 17th-century record of the Dominican dialect only in the forms: uaráhǫią, tahulu-, tahudu-, súhanų, uáinamuháią, uairihali, nhapúkasa, hádagię, hágurua; and that in the last two words it corresponds to his and recent Dominican nh (as in nhapúkasa), which probably was and remained a unit phoneme (aspirate n). In hália *where* and iąhį *there* (*non-demonstrative*) it corresponds to zero in his record ("állia", "nyáim"); in all other of its occurrences in this text and translation, h corresponds to Breton's k—as do also k of the text and g of the translation. Clearly, therefore, Breton's k was later split into—or, less likely, already represented—two phonemes, one of which has since been merged, at least so far as the Central American dialect is concerned, in the pre-existing aspirate h. But there are reasons for believing that this merger did not take place in Dominican.

The /p/—/b/ opposition of early and recent Dominican—unlike that of modern Central American—was based on aspiration and not voicing. Aspirate /p/ had occlusive and affricative (written "pf" by Breton) variants, the latter being weakened in recent Dominican to spirants (written "f" by Ober and Rat, but heard by me as bilabial) that occurred only and always after primary stress, as in: irúpųti *it is good* (with spirant), but irupúųti *it is very good* (with stop). Unaspirated /b/ had voiced and voiceless variants, the latter occurring only but not always in Anlaut. On the other hand, in modern Central American (and also in recent Vincentian so far as can be judged from the scanty data on this dialect) earlier p became, almost without exception, labiodental f, while a new /p/—/b/ opposition based on voicing arose, parallelling (probably earlier) /t/—/d/ and (probably later) /k/—/g/. In view of these considerations it seems most unlikely that, in Dominican, a dorsal stop should have been spirantized to x, and x merged in h, while /p/, another stop of the same series, evolved no further than the acquisition of a spirant allophone. And since Rat mentions (but does not write) the sound of "ch . . . as in the Scotch *loch*"—while [x] and [kx], both sounds foreign to Creole, were recorded by me from children of native speakers—I strongly suspect that recent Dominican had a dorsal obstruent (aspirate stop, affricate, spirant, or all three?) in opposition with both unaspirated k and the aspirate h; and that Rat should have distinguished these as, for example, in: taxusákuią *she sews* and tahulúxaią *she pounds* of sentence 4 in the above text.

Before proceeding, a free English translation of this text may be given as follows: 1. *The name of (the place) where I live is B.* 2. *I have a wife; we have four children: two boys, two girls.* 3. *My work is making baskets; I chop wood/trees, I go fishing.* 4. *My wife stays at home; she sews, cooks food, washes,*

grates manioc, pounds plantains, sweeps out the house, works in her garden. 5. *My children are all grouwn up.* 6. *One boy has grown big; he works for himself.* 7. *My mother was a Carib, my father a mulatto.* 8. *I was born at U.* 9. *After seeking a wife, I went to B.* 10. *All my children were born there.*

So far as vocabulary is concerned, the rather considerable divergence appears to be one of usage, and not due to absence of cognates. Of the words found in the text but not in the translation, only bíąbri (or biąburi, as both Breton and I heard it) *four*, derived from bíama *two*, has been lost in the Central American dialect, as it was in Vincentian of 1877, and replaced in both by gádoro, borrowed from Fr. quatre. And of the forms found in the translation but not in the text, only gádoro, erédestay, *stop* (perhaps a loan; cf. Fr. rester, arrêter) and uáinamu- *grow(n) up* (which, however, has the root uái- *big, old* in common with Dominican uáita) have no attested cognates in recent Dominican. But in Central American, hália *where* is usually interrogative; erémoda means *remain or get left* (*behind*), not *stay*; and nibąią, from ibári *grandchild*, means *my grandchildren* (uaráhǫią *our children*, the word here employed by my Black Carib informant, contains iráho *child*, which same form and meaning are attested also for recent Dominican). Modern Central American númari *my wife or my husband* is derived from -uma *with, accompanying*, and so means literally *my companion or my consort*; but niáni *my wife*—and also ninǫuna, which appears to have been its usual equivalent in recent Vincentian—are remembered as archaic forms, and sometimes employed facetiously. Cognate with áutubu *at home* of the Dominican text is Central American áudobu—or perhaps, with assimilation, áudubu—*at/in town*, from áudo *town*; while Central American uábię *at our home* has an attested cognate equivalent in recent Dominican uábuię. Similarly, Central American bádirugu corresponds to recent Dominican batíruku *in the house*, but means *in the hut*, from bádi *hut* (*temporary shelter*), which is not a usual word for *house*. And, on the other hand, Dominican muénata corresponds to Central American mú(o)nada *in the house*, but means *in the "muéna"*; this last word referring, in recent Dominican and still today in local Creole, to a particular type of thatched construction, now chiefly employed as a hurricane shelter. Central American hafúgaca corresponds to nhapúkąsa *they were born* of the Dominican text, but means *they hatched out* (*as of chickens*); while recent Dominican nhakurua corresponds to hágurua *they were born* of the Central American translation, but to a Dominican Carib may well have meant only *they were cast down* (which is also, as well as *they were born*, one of its meanings in Central American).

I asked my Black Carib informant to make his translation as literal as was consistent with acceptable usage in his mother-tongue; and in one or two cases he has perhaps gone beyond this. So, in his language (which has terms for distinguishing speech-communities, but not races), muládu means *ladino, Spanish-speaking Central American* (just as mégeru, corresponding to recent Dominican mékeru *Negro*, means *English-speaking Central American*). Today, both sexes normally employ gąhį *manioc* of the "women's speech"; though "men's" giére *manioc*, by which my informant translated Dominican kíere, is still known to all. He also suggested lunígua (Dominican luníkua) as a possible though rather pedantic alternative to colloquial lúgua *for himself*. The word láugię, by which he translated Dominican láuseę, usually means *over, above*, or sometimes *since*; but in the context in which it occurs here, lárigię *after* (Dominican lárisię) would, I think, be more usual. On the other hand, my informant has taken some liberties with the text, which, he said, "common sense demanded"; thus, he has ignored núma *with me* after kąianítina = gámaritina *I have* (*a*) *wife* (con-

taining, respectively, iani *wife* and úmari *consort*), and substituted uaráhǫią *our children* for Dominican níbaią *my children* throughout. Other types of divergence are best taken sentence by sentence; and for this purpose literal word-by-word translations of the text and its Central American version are given below.

Literal translation of Dominican

1. *where that-it-be I-stay* B. *it-is its-name.* 2. *I-have-wife with-me, with-us four my-children: two boys, two girls.* 3. *My-work I-make basket, I-chop for-it wood, my-going to-fish.* 4. *my-wife she-stays at-home, she-sews, she-cooks food, she-washes, she-grates manioc, she-pounds plantain, she-sweeps-house-inside, she-works her-garden.* 5. *my-children they-have-all grown-up.* 6. *one this boy he-has-got-big, he-works for-himself.* 7. *my-mother she-was-Carib, he-was-mulatto my-father.* 8. *I-was-born at-U.* 9. *after-it looking-for my-wife, my-going* B. 10. *there they-were-born all my-children.*

Literal translation of Central American

1. *there that-it-be I-stay B. it-is its-name.* 2. *I-have-wife, they-are-with-us four our-children: two boys, two girls.* 3. *its-making basket which-is-my-work, I-chop wood, my-going to-fish.* 4. *my-wife she-stays at-our-home, she-sews, she-cooks food, she-washes, she-grates manioc, she-pounds plantain, she-sweeps house-in, she-works her-garden.* 5. *they-have-grown-up all our-children.* 6. *he-has-got-big one from-among-them boys, he-works for-himself.* 7. *she-was-Carib my-mother, he-was-mulatto my-father.* 8. *I-was-born at-U.* 9. *after-it looking-for my-wife, my-going B.* 10. *there they-were-born all our-children.*

The sentences seem to be unusually simple, at least for the Central American dialect; and it may be doubted whether either the text or its translation is truly representative of normal connected speech. Nevertheless there appear to be some interesting differences between the two. In the text, there is no verb in the second clause of 2; and my informant found it necessary to verbalize uáma *us-with* as uámaianų *us-with-are-they.* His rearrangement of the first clause in 3—meaning: (*it is*) *basket-making which is my work*—was necessary, he said, "in order to make sense." And in the second clause of the same sentence he has left lúni (Central American colloquial lų) untranslated, this word usually expressing or indicating, in his language, an indirect object (*to or for him*) with masculine referent: rú-bai lų túguci *give it to her father*, rú-bai lų́ *give it to him.* However, it is also employed in Central American to express or to indicate a direct object when the preceding verb is habilitative: gerégatti lų garífuna *he can speak Carib*, gadógattu lų́ *she can do/make it.* While the word-orders: action-actor-goal (or action-undergoer) and actor-action-goal (or undergoer-action) are both permissible in both dialects, only the former is "normal"—at least in Central American, which employs the latter, "inverted" order only for the sake of emphasis or contrast. So, while retaining the inverted order in 4, my informant has "restored" the normal order in 5, the first clause of 6 and the first clause of 7. Moreover, his version of 5 assumes that Rat's English translation of this sentence is correct—that is, that *all my children* is the subject, *they have grown up* the predicate. However, verbalized derivatives of sų *all* usually mean *finish*; and my informant believed, I think rightly, that the meaning of the Dominican sentence was: *my children have finished growing up*; in which case he would change his own version of it to: súhaią auáirida niráhǫią, literally: *they-have-finished to-grow-up my-children*, which comes nearer to the Dominican. As for the first clause of 6, the meanings of whose individual words presented not the slightest difficulty for him, my informant said that the construction as a whole was meaningless to him and that he could only follow the English translation. So also, in Dominican, uáiriti uéue can mean either *trees are big* or, according to context, *big* trees (uasúaha uáiriti uéue *we cut down the large trees*, to take an example from another

of Rat's texts); but in Central American, uáiriti uéue can mean only *trees are big* (or *the tree is big*), while *big trees* is expressed by uéue uáiriti.

The morphological apparatus is very much the same in both dialects; though here again there appears to be some difference of usage, and, of course, allowance must be made for phonological differences and for colloquial contractions usual in Central American but not, it would seem, in Dominican: -uni > -ų, -uária > -uái, -hanų > -hąią, etc. So, for example, what I call the "imperfective" (a mood rather than an aspect or tense) serves, in both dialects, both future-tense and subordinate functions: batokúbali = badógubai *thou wilt do/make it*, but itá-lią batokúbali líha = ída lią badógubalí lea *how is-it that-thou-didst-it this?* káta ánoko buakúbali = ka anógo buágubai *what sickness have you got?* (lit.: *that-is-upon-thee*); but Central American requires the insertion of some such expression as dą le *when* in: barúmukuią-buka batokúbali = barúmuguią-buga dą le badógubali *you were sleeping when you did it*, and never employs an imperfective auxiliary in -uba to form what Rat calls the "conditional," as in: tiká-buba útu, . . . *if* (or *when*) *you catch fish*, . . . , which would be expressed in Central American by: áhaį badíga údu, . . . (lit.: *if-it thou-catch fish*), or by áhąbu adíga údu, . . . (lit.: *if-thou catch fish*).

It seems clear from the foregoing that the Dominican and Central American dialects of, say, fifty or sixty years ago, cannot have been mutually intelligible to more than a very limited extent—even if Rat was altogether mistaken about the former's stress-pattern. As for recent Vincentian, extant data are too few to warrant any conclusion; but my impression is that it was, though in some ways intermediate between the other two dialects, much nearer to its Central American offshoot than to Dominican. So, compare the one sentence of Vincentian cited by Ober with its Central American and Dominican translations:

nícigubáli búni lébeci uáigan auási. (recent Vincentian)

nícigubái bų lebégi uáigą auási. (modern Central American)

nisikúbali búni lébesi uáikani auási. (recent Dominican)

I'll-give-it to-thee its-payment (*of*) *our-food* (*of*) *maize.*

DOMINICA, BRITISH WEST INDIES

SACLAN ONCE MORE

M. S. BEELER

In my discussion of Saclan in this journal (21. 201–209, 1955) it was demonstrated that the closest affiliations of the language were with the two northern Sierra dialects of eastern Miwok; it was also shown, however, that certain lexical isoglosses pointed toward connections with the more westerly Miwok languages and with some of the forms of northern Costanoan. I accordingly suggested for the aboriginal habitat of the speakers of Saclan a fairly narrow band of territory extending westward from the Sierra foothills some forty or fifty miles across the level floor of the San Joaquin valley as far as the Mt. Diablo massif. This inference had to be based solely on linguistic data, for at the time the article was written no intensive study had been made of the scattered evidence—published and unpublished—derived from early Spanish sources and bearing on the problem of the geographical position of this language at the beginning of the historical period in the late eighteenth century. Such a study has now been published: S. F. Cook's "The Aboriginal Population of Alameda and Contra Costa Counties, California" (Anthropological Records 16:4, Berkeley and Los Angeles, 1957) assembles a large amount of historical evidence which is most easily interpreted as meaning that the Saclan Indians, in the 1790's, were living in the

Lafayette-Walnut Creek-Danville area, to the west, that is, of Mt. Diablo.

In that area they would have been contiguous with the variety of Santa Clara Costanoans who dwelt immediately to the south in the Livermore valley, and to the north and northwest with the Costanoan Karkin and Huchiun. (This is the spelling used by Cook of the name of the tribelet which lived in the Richmond-San Pablo area; Arroyo de la Cusasta wrote Juichun, and other variants are Juchillon, Cuchillon, Hochon, Outchioun, and Utschiun. Cook's spelling is adopted here.) Such a relative geographical position would account more satisfactorily than the hypothesis presented in my previous article for the lexical isoglosses linking Saclan with Santa Clara, Karkin, Huchiun, and Suisun which were listed in paragraphs 4.7 and 8.

In that region, however, they would have been isolated from the main body of Miwok speakers to the east, resembling in this respect their linguistic cousins the Coast and Lake Miwok. For there is reason to think that the northernmost Yokuts, the Chulamni, reached the delta of the San Joaquin river, thus effectively blocking any contact of the Sierra Miwok with the west. Yet there can be no doubt that, linguistically, Saclan was most closely related to the two northerly hill dialects of eastern Miwok.

These apparently conflicting sets of facts are most simply reconciled by supposing that Saclan was once spoken in the plains along the lower courses of the Tuolumne, Stanislaus, and Mokelumne[1] rivers, to the west, that is, of the historical Sierra dialects; and that it was displaced westward by a northerly expansion of Yokuts. Professor A. L. Kroeber, in a monograph ("Recent Ethnic Spreads") now in press which he has kindly permitted me to see, suggests just such a northerly push of the Yokuts, and proposes as its cause the movement across the Sierra Nevada of the speakers of what is known to us as Western Mono. Kroeber guesses that this northward spread of the Yokuts may have been completed as recently as three hundred years ago, which might mean that the Saclan had been in their historical habitat only a century or less when the Spaniards arrived. The linguistic map of aboriginal California is a variegated one, and such ethnic shifts as those here inferred must have occurred countless times in the long course of unrecorded history.

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[1] The village of Sakayakümni, on the lower Mokelumne in historical Plains Miwok territory, could preserve in its name an indication of the ethnic affinities of an earlier stratum of population.

RATE OF MORPHEMIC DECAY IN ARABIC

ALAUDDIN ISMAIL SAMARRAI

The method of glottochronology has been applied to 13 languages. The result has been the derivation of a rate-constant (k = 0.8048 $\pm$ 0.176/mill.) which is taken to mean that "on the average about 81% of the basic-root-morphemes of a language will survive as cognates after 1000 years, for all languages, at all times."[1] It is significant, however, to note that 11 out of the 13 examined languages were Indo-European, and it is desirable to submit more non-Indo-European languages to the test to determine whether this rate-constant holds for other than the Indo-European languages.[2] This paper is intended to fill a part of this gap.

The study has been restricted to modern Egyptian, Iraqi, and Jordanian dialects of Arabic as contrasted to Classical Arabic. The same word-list which has been used to test the 13 languages has been used in this study, eliminating, however, four out of the 215 words which comprise the original list. These words are *at*, *berry*, *lake*, and *not*.

[1] Robert B. Lees, The Basis of Glottochronology. Lg 29.119.

[2] Aryon Dall'Igna Rodrigues, Eine neue Datierungsmethode der vergleichenden Sprachwissenschaft. Kratylos, Jahrgang II, Heft I (1957), 4.

TABLE 1

English	Classical Arabic	Egyptian	Iraqi	Jordanian
count	ḤSB, ʿDD	0, +	+, +	0, +
dry	YBS, NŠF	0, +	+, +	0, +
float	ʿĀM, ṬFĀ	+, 0	0, +	+, 0
flow	SĀL, SĀB	0, +	+, 0	0, +
flower	WRD, ZHR	0, +	+, 0	+, 0
grass	ʿŠB, ḤŠĪŠ	0, +	0, +	+, 0
hold	MSK, QBḌ	+, 0	0, +	+, 0
in	FĪ, B	+, 0	0, +	+, 0
left	YSĀR, ŠMĀL	0, +	+, 0	0, +
old	QDĪM, ʿTĪQ	+, 0	0, +	0, +
road	ṬRĪQ, DRB	+, 0	0, +	+, +
root	ʿRQ, JThR, ŠRŠ	0, +, 0	+, 0, 0	0, 0, +
rotten	ʿFN, NTN	0, +	+, 0	0, 0
rub	DʿK, FRK	+, 0	0, +	+, 0
see	RʾĀ, ŠĀF	0, +	0, +	0, +
spit	TFL, BṢQ	+, 0	+, 0	0, +
split	FLQ, ŠQQ	0, +	0, 0	+, 0
straight	mustQīM, ʿDL	0, 0	0, +	+, 0
vomit	istaFRaGh, QĀʾ	+, 0	0, +	0, 0
warm	DāFiʾ, ḤāMĪ	+, 0	+, 0	0, +
wide	WāSiʿ, ʿRīḌ	+, 0	0, +	+, 0
wife	ZaWJa, imra'a	+, +	0, +	0, +

This elimination was necessary because *at* and *not* cannot be translated properly into Arabic independently of the content of the sentence. *Berry* and *lake* depend upon geographical circumstances and definition; thus, they are not, properly speaking, culture-free in relation to Arabic.

In the application of the method to Arabic a serious problem arises. In translating the items from the control language (English), one is often confronted with the phenomenon of several apparently synonymous equivalents in Classical Arabic. A choice among these would be easy had the several Arabic dialects shown any unanimity themselves in their choice. But this is not the case. In several instances, one dialect has retained one synonym, another a second and a third still another.

Table 1 lists those items which can be translated from English into more than one word in Classical Arabic.[3] Other items in the list show the same phenomenon, but the table contains only those where there is inconsistency in retention among the later Arabic dialects.

The following formula[4] has been applied to find k, the fraction retained per millenium, for the individual dialects: $N = N_0 e^{-\lambda t}$, where N_0 = the number of morphemes at time t_0, N = the number of morphemes left at a later time (A.D. 1958), e = 2.718, and λ = the rate-constant. The following is the tabulation of the data:[5]

Dialect	N_0	N	t	$k = e^{-\lambda}$
Egyptian	211	183	1.25	0.8923
Iraqi	211	188	1.25	0.9118
Jordanian	211	191	1.25	0.9267

The table shows that Egyptian has retained about 89.2% of the basic Classical Arabic morphemes, Iraqi has retained about 91.2% and Jordanian about 92.7%.

With these findings it is evident that the common view about the conservatism of

[3] These morphemes have been considered "retained."

[4] Lees, op. cit., 120.

[5] It has been assumed that Arabic became spoken in Egypt, Iraq, and Jordan after the Islamic conquest (about 1.25 millenia).

the Semitic languages is true. Moreover, the results obtained here suggest that instead of a rate-constant common to all languages, there may be a rate-constant for each family of languages.

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CONCERNING THE VALIDITY OF SOME TRANSLATIONS

DOUGLAS TAYLOR

John A. Rea's article "Concerning the Validity of Lexicostatistics" (IJAL 24.145 ff.) probably has done more to convince its readers of the need for great care when filling in the test-list for a particular language than to discredit glottochronology itself. The list of meanings to be elicited is given on the forms prepared by Morris Swadesh in both Spanish and English (yo—I, tú—thou, etc.); and he has explained that these words, chosen for their comparative freedom from ambiguity, are not necessarily in every case identical with those by which their meanings should be rendered in diagnostic lists for the same languages. Thus, the items tú—thou and ustedes—ye would both give modern standard English: you; while ave—bird and arder—burn, for example, might, for many varieties of modern standard Castilian, give: pájaro and quemarse respectively. But I, and perhaps others, have hitherto considered such cases, in which an archaic or a literary term is less ambiguous than its modern or colloquial equivalent, to be relatively rare; and it is therefore rather startling to find that Rea 'translates' no less than twelve of the Spanish items on the 100-word list (chico, gente, ave, cabello, uña, cuello, seno, andar, arder, vereda, sierra, rojo) by other and unrelated Spanish words: pequeño, persona, pájaro, pelo, garra, pescuezo, pecho, caminar, quemarse, camino, montaña, colorado.

I do not doubt the authenticity of these elicited forms; but it may be questioned whether any two independent, native speakers of standard Castilian, aware of the nature and purpose of the test-list, would unhesitatingly agree that each and all of them were the "common, everyday equivalents" of the Spanish and English words listed. These latter were not chosen at random; thus, Eng. small may be less common than little, but its meaning is the more stable and free from emotional implications (an average-sized woman may be 'a little goose', but hardly 'a small goose').

The importance of using a bilingual list for eliciting 'equivalents' can hardly be exaggerated (one drawn up in four European languages—say, Spanish, English, French, German—would be still better); so, unless I am mistaken, the item uña—claw indicates that the more inclusive term, where such exists, is the one wanted (I take it that Sp. uña means *nail or claw*, Sp. garra only *claw*). And if I am right, grasa—grease should be 'translated' by Eng. *fat*, carne—meat by Eng. *flesh* and Fr. *chair*; since, so far as my own speech is concerned, grease is a kind of *fat* (*melted, or meant for lubrication*), meat a kind of *flesh* (*meant for consumption*). And for similar reasons I should prefer caliente—hot to caliente—warm (warm meaning *hot to a minor degree*), and, assuming Sp. camino to mean the same as Fr. chemin: *voie de terre, terrain préparé pour aller d'un lieu à un autre. . . Voie de communication quelconque. .*, camino—road to vereda—path; path, and likewise vereda, meaning a kind of *road* (*restricted to pedestrians*). In any case, Rea's Fr. route is out of place here.

In French there is no simple free form meaning *not*. Perhaps the nearest equivalent is the phrase: non pas; but if a simple bound form should be preferable, pas (which is frequently employed without ne) is nearer the mark than Rea's ne (which can occur without pas, point, jamais, etc. only in a very restricted distribution). Probably, 'free' moi and toi should be preferred to 'bound' je and tu. Rea's Fr. semence is certainly translatable by semilla—seed; but the latter item's "common, everyday equivalent", as

these words are employed in gardening or agriculture, is Fr. graine(s). Swadesh has made it clear, by asking for acostado—lie, sentado—sit and de pie—stand, that the words wanted here are those expressing states rather than actions; yet Rea gives Sp. sentarse and Fr. s'asseoir *to sit down* (together with these verbs' equivalents in the other languages), and Fr. étendu *spread or stretched out* instead of Fr. couché *lying*. The principal meaning of the item seno—breast, as common sense and my dictionary tell me, is: *either milk-secreting organ in woman*, whose French equivalent is sein and not poitrine: a mother 'donne le sein à son enfant'—NOT 'la poitrine'! And I rather believe the same to be true of Portuguese seio and Italian seno; though for all I know Rumanian piept, Catalan pits (not pit, as Rea has it), Sardinian pettus and Rheto-Romance pets may be the common equivalents in these languages.[1]

Every language may present—some more, some less—its own special problems when it comes to translating this or any other word-list into it; and a few of them may prove to be insoluble. But enough has been said to show that Rea was careless of the meanings required or of their "common equivalents" or of both; and a tool should not be condemned by one who has not yet learnt to use it properly.

DOMINICA, BRITISH WEST INDIES

THE FOLKLORE AND FOLK MUSIC ARCHIVIST, Vol. I, No. 1, March, 1958. A quarterly bulletin devoted to the collection, documentation, indexing, and cataloguing of folklore and folk music. The ARCHIVIST is a joint publication of the Folklore Archives and the Archives of Folk and Primitive Music, Indiana University, Bloomington.

[1] This marked preference for the family of Lat. pectus may indicate that Rea's informants had learnt to associate the English word 'breast' only or principally with *breast of chicken* = Fr. poitrine de poule (strictu sensu). A linguistic investigator should not, however, allow himself to be thus misled by a local (and unnatural) bias.

The March issue (4 pp.) contains an article on the general problems of the organization of folklore archives by Wm. Hugh Jansen, University of Kentucky; short articles on the Indiana University Folklore Archives and the Archives of Folk and Primitive Music by the respective Directors, Richard M. Dorson and George List; and a discussion of electrical supply conditions throughout the world by George Siddons, Electronics Engineer, Indiana University.

Subsequent issues will present further discussions of the problems involved in the archiving of folklore; short descriptions of the organization and holdings of various archives in the United States; and discussion of technical problems of recording and transcription, such as the re-recording of phonograph cylinders. Correspondence should be directed to the editor, George List.

Scope Note of

ANTHROPOLOGICAL LINGUISTICS

Beginning in January, 1959, the Archives of Languages of the World will issue a monthly publication entitled *Anthropological Linguistics*. The size of issues will vary from circa 20 to circa 100 pages. Short papers on restricted problems in phonemics, morphophonemics, morphemics, and transformational and comparative grammar—either preliminary or final solutions, but heavily exemplified—will be brought together in slimmer issues. Single issues of up to monographic size are to include collections of papers from symposia and handbooks of field methods, lexical lists and analyzed texts, especially in the hard-to-publish range of 20 to 100 pages.

Anthropological Linguistics is a publication of the Archives; hence, the majority of papers appearing in it will be attested by tape recordings available to all interested scholars through the Archives. This does not imply that contributors will be restricted to scholars working in the Archives

at Indiana University. In fact, one strong motivation for publishing *Anthropological Linguistics* is to attract data-oriented papers from scholars elsewhere, especially those who can provide attestation of cited data in the form of tape recordings. Such tape recordings will be copied by the Archives and the originals returned to the collector, thereby enabling other scholars to work with the tape in the Archives; or elsewhere, by having another copy made.

Subscriptions from libraries and individual scholars, and papers attestable by tape recordings are now being solicited. The subscription rate is $3.50 a year; each subscription covers the cost of nine numbers to be issued during the nine academic months (Jan., Feb., Mar., Apr., May, June, Oct., Nov., Dec.). Papers for publication (and subscriptions) should be sent to the editor, Dr. Florence M. Voegelin, Anthropology Department, Indiana University, Bloomington, Indiana.

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